VOLUME 60 [W. B. No. 1078] NUMBER 5

MONTHLY WEATHER REVIEW

MAY, 1932

CONTENTS

UNITED STATES DEPARTMENT OF AGRICULTURE

WEATHER BUREAU

WASHINGTON, D. C.

For sale by the Superintendent of Documents, Washington, D. C. - - - - - - - - - - - - - - - - See page 4 of cover for prices

MONTHLY WEATHER REVIEW

Editor, W. J. HUMPHREYS

VOL. 60, No. 5
W. B. No. 1078

MAY, 1932

CLOSED JULY 11, 1932
ISSUED AUGUST 11, 1932

NOTE.—Owing to the necessity of drastically reducing the printing cost of the REVIEW to keep within the funds for the fiscal year, all "contributions" are omitted in this issue. It may be necessary to follow the same procedure in the next number also.—Editor.

BIBLIOGRAPHY

C. FITZHUGH TALMAN, in Charge of Library

RECENT ADDITIONS

The following have been selected from among the titles of books recently received as representing those most likely to be useful to Weather Bureau officials in their meteorological work and studies:

Abbot, C. G., & Bond, Gladys T.
Periodicity in solar variation. Washington. 1932. 14 p. figs. pl. 24½ cm. (Smith. misc. coll., v. 87, no. 9.)

Birkeland, B. J., & Föyn, N. J.
Klima von Nordwesteuropa und den Inseln von Island bis Franz-Josef-Land. Berlin. 1932. 124 p. figs. 27 cm. (Handbuch der Klimatologie. Bd. 3, Teil L.)

Burwash, L. T.
Canada's western Arctic. Report on investigations in 1925–26, 1928–29, and 1930. Ottawa. 1931. 116 p. illus. maps (1 fold.) 25 cm.

Fedorov, E. E.
Complex method in climatolgy and its application to agriculture. Trenton. 1932. 32 p. 23 cm. (N. J. Dept. agric. Bur. plant industry. Circ. no. 207.)

Haeberlin, C., & Perlewitz, P.
Klima-Atlas für die Meeresheilkunde an der deutschen Seeküste. Hamburg. 1932. 55 p. figs. 23½ cm.

Hoelper, Otto.
Untersuchungen über Sonnen- und Himmelsstrahlung. Aachen. 1932. 52 p. figs. 31½ cm. (Veröffentl. met. Observ. Aachen.)

India. Meteorological dept.
Winds, weather and currents on the coasts of India and the laws of storms. 1931. Calcutta. 1931. 51 p. figs. plates. 24½ cm.

Kimura, Masamichi.
Consideration on the emission of the auroral green light in the night sky. p. 166–176. 26½ cm. (Sci. papers Inst. phys. & chem. research. no. 365. v. 18. May 1, 1932.)

Mémery, Henri.
Le joli mois d'avril 1932. Cause probable des perturbations météorologiques. Talence. 1932. 2 p. 28 cm. [Manifolded.]

Middleton, W. E. Knowles.
Measurement of visibility at night. p. 25–33. figs. 25 cm. (Roy. soc. Canada. Trans. Sec. 3, 1932.)

Mörikofer, W.
Zur Bioklimatologie der Schweiz. Teil 2. Die Strahlungsverhältnisse. 11 p. figs. 26 cm. (Sonderab.: Schweiz. med. Jahrb. 1932.)

Ripley, W. R.
Relative humidity—its measurement and control. [Tacoma.] n. d. [3 p.] illus. 28½ cm.

Sapper, K.
Klimakunde von Mittelamerika. Berlin. 1932. 74 p. figs. 27 cm. (Handbuch der Klimatologie. Bd. II, Teil H.)

Väisälä, Vilho.
Bestrebungen und Vorschläge zur Entwicklung der radiometeorographischen Methoden. Eine vorläufige Mitteilung. Helsingfors. 1932. 10 p. illus. 24 cm. (Mitteil. met. Inst. der Univ. Helsingfors. N:o 20.) (Soc. scient. Fennica. Comment. physico-math. VI. 2.)
Über die Wirkung der Windschwankungen auf die Pilotbeobachtungen. Zweite Mitteilung. Helsingfors. 1932. 33 p. plate (fold.) 24 cm. (Mitteil. met. Inst. der Univ. Helsingfors. N : o 21.) (Soc. scient. Fennica. Comment. physico-math. VI. 5.)

Volochine, F.
Bibliographie actinométrique, publiée par F. Volochine, avec le concours de l'Association de météorologie de l'Union de géodésie et de géophysique. Sept. 1931. 27½ cm. [Manifolded.]

Weather vanes. p. 49–64. illus. 31 cm. (Architecture: July 1931.)

SOLAR OBSERVATIONS

SOLAR RADIATION MEASUREMENTS DURING MAY, 1932

By HERBERT H. KIMBALL, in Charge Solar Radiation Investigations

For a description of instruments employed and their exposures, the reader is referred to the January, 1932, REVIEW, page 26.

Table 1 shows that solar radiation intensities averaged above the normal intensity for May at Washington and Madison, and slightly below at Lincoln.

Table 2 shows a deficiency in the total solar radiation received on a horizontal surface at Madison, Wis., Twin Falls, Idaho, and Gainesville and Miami, Fla.; an excess was received at all other stations, which was especially marked at New York and Chicago.

Skylight polarization measurements, obtained at Madison on six days give a mean of 60 per cent and a maximum of 66 per cent on the 28th. At Washington, measurements obtained on seven days give a mean of 54 per cent and a maximum of 59 per cent on the 3d. These are average values for May for both stations.

TABLE 1.—*Solar radiation intensities during May, 1932*

[Gram-calories per minute per square centimeter of normal surface]

Washington, D. C.

Date	Sun's zenith distance: 8 a.m.	78.7°	75.7°	70.7°	60.0°	0.0°	60.0°	70.7°	75.7°	78.7°	Noon
	75th mer. time	Air mass: A. M.					P. M.				Local mean solar time
	e.	5.0	4.0	3.0	2.0	[1] 1.0	2.0	3.0	4.0	5.0	e.
	mm.	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*mm.*
May 3	4.57	------	0.85	1.02	1.22	1.50	------	------	------	------	5.16
May 6	8.81	------	------	------	------	0.99	------	------	------	------	11.38
May 16	11.81	------	------	0.76	------	------	------	------	------	------	12.24
May 18	6.27	------	------	------	------	1.46	1.13	------	------	------	3.63
May 20	8.81	------	------	------	1.04	1.38	------	------	------	------	5.16
May 23	4.37	------	------	------	------	1.45	1.12	------	------	------	4.37
May 24	8.18	0.59	0.67	0.76	0.99	1.32	1.04	------	------	------	9.83
May 25	10.59	------	------	------	0.98	1.22	------	------	------	------	14.10
May 26	13.13	------	------	------	1.01	1.34	1.10	------	------	------	14.10
May 27	15.65	------	------	------	1.10	1.30	------	------	------	------	16.79
Means	------	(0.59)	(0.76)	0.85	1.04	1.33	1.10	------	------	------	------
Departures	------	−0.05	+0.05	+0.03	+0.05	+0.04	+0.19	------	------	------	------

TABLE 1.—*Solar radiation intensities during May, 1932*—Continued

Madison, Wis.

Date	Sun's zenith distance: 8 a.m.	78.7°	75.7°	70.7°	60.0°	0.0°	60.0°	70.7°	75.7°	78.7°	Noon
	75th mer. time	Air mass: A. M.					P. M.				Local mean solar time
	e.	5.0	4.0	3.0	2.0	[1] 1.0	2.0	3.0	4.0	5.0	e.
	mm.	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*
May 2	4.75	------	------	0.91	1.00	------	------	------	------	------	3.63
May 10	7.57	------	------	------	------	1.39	------	------	------	------	6.76
May 12	7.87	------	------	------	------	1.34	------	------	------	------	7.57
May 13	7.87	------	------	------	1.08	------	------	------	------	------	7.04
May 14	9.47	------	------	1.06	------	1.35	------	------	------	------	9.83
May 17	5.16	------	------	------	1.20	------	------	------	------	------	3.30
May 19	5.56	------	------	0.88	1.10	1.33	------	------	------	------	6.27
May 23	4.95	------	------	------	------	1.36	1.06	0.82	------	------	5.16
May 28	5.36	------	------	------	1.22	1.32	------	------	------	------	5.79
Means	------	------	------	0.95	1.12	1.35	(1.06)	(0.82)	------	------	------
Departures	------	------	------	+0.01	+0.02	−0.01	+0.03	−0.07	------	------	------

Lincoln, Nebr.

May 9	8.18	0.46	0.57	------	------	------	------	------	------	------	8.48
May 11	6.76	------	------	0.93	1.12	1.40	1.13	0.92	0.79	0.68	5.79
May 12	6.76	0.45	0.61	0.77	0.98	1.34	0.90	------	------	------	8.48
May 13	8.18	------	------	------	1.04	1.34	------	------	------	------	9.14
May 14	8.18	------	0.73	0.90	1.10	1.39	1.07	0.88	0.72	------	8.81
May 16	5.79	------	0.73	0.96	1.13	1.43	------	------	------	------	12.24
May 18	10.21	------	------	------	------	------	1.08	0.88	0.73	------	7.29
May 23	10.59	------	------	0.93	1.08	1.32	------	------	------	------	11.81
May 24	11.81	------	------	------	------	1.41	1.11	0.93	0.78	------	10.97
May 31	13.61	------	------	------	------	------	1.20	1.00	0.76	------	12.68
Means	------	(0.46)	0.66	0.90	1.08	1.38	1.08	0.92	0.76	(0.68)	------
Departures	------	−0.19	−0.13	−0.03	−0.04	±0.00	−0.02	−0.01	−0.02	−0.04	------

[1] Extrapolated.

Table 3 summarizes solar radiation measurements, I_y and I_r, obtained by means of the yellow and red glass filters described in the February, 1932, REVIEW, and values of the coefficient of atmospheric turbidity β derived therefrom. The turbidity values do not differ materially from those for April.

TABLE 2.—*Average daily totals of solar radiation (direct+diffuse) received on a horizontal surface*

Week beginning	Washington	Madison	Lincoln	Chicago	New York	Fresno	Pittsburgh	Fairbanks	Twin Falls	La Jolla	Gainesville	Miami	New Orleans
	Gram calories per square centimeter												
1932	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*	*cal.*
April 29	494	322	508	380	477	541	387	399	413	442	629	579	322
May 6	288	421	481	301	338	668	337	400	604	373	580	554	344
May 13	536	604	586	576	551	635	551	464	564	393	515	515	246
May 20	651	487	585	546	653	719	616	519	527	572	534	372	239
May 27	590	487	483	474	515	701	459	335	459	505	474	442	424
	Departures from weekly normals												
April 29	+34	−128	+17	+15	+13	−38	−7	----------	−131	+24	+14	+33	----------
May 6	−158	−33	+21	−75	−31	+57	−69	----------	+4	−47	−47	−17	----------
May 13	+73	+134	+68	+184	+173	+4	+114	----------	−70	−43	−107	−49	----------
May 20	+154	+1	+30	+126	+250	+59	+133	----------	−133	+102	−58	−147	----------
May 27	+74	−3	−24	+49	+104	+39	−5	----------	−165	+33	−93	−41	----------
	Accumulated departures on May 29, 1932												
	+2,415	−987	−1,295	+5,964	+7,749	+2,562	+2,387	----------	−4,753	+3,794	----------	+2,485	----------

TABLE 3.—*Solar radiation measurements, and determinations of atmospheric turbidity factor, β. Washington, May, 1932*

Date and solar hour angle	Solar altitude, h.	Air mass, m.	I_m	I_y	I_n	β	Blueness of sky	Atmospheric dust particles per cubic centimeter	Polarization (per cent) and clouds
May 3	° ′		*gr. cal.*	*gr. cal.*	*gr. cal.*				
5:17 a	18-05	3.19	0.978	*0.741*	0.612	0.067		483	
5:11 a	19-15	3.02	1.000	.763	*.623*	.069			
4:50 a	22-43	2.59	1.101	*.834*	.677	.067			
4:46 a	23-29	2.49	1.120	.847	.691	.075			
4:19 a	28-45	2.08	1.217	.879	*.706*	.065			
4:15 a	29-31	2.03	1.225	*.883*	*.708*	.065	5		58.6
3:31 a	38-44	1.60	1.282	*.927*	.738	.087			
3:25 a	39-53	1.56	1.291	.933	*.745*	.075			
1:30 a	59-12	1.16	1.432	*.990*	.778	.078			
1:26 a	59-57	1.15	1.438	.990	*.778*	.075			
0:34 a	65-40	1.09	1.449	.997	*.772*	.075			
0:30 a	65-54	1.09	1.432	*.975*	.770	.078			
May 4									
3:34 a	38-18	1.62	1.180	------	.703	.120		840	
3:29 a	39-10	1.58	1.201	.887	*.703*	.120			
May 16									
5:20 a	19-36	2.96	.762	.612	*.510*	.145		966	
5:16 a	20-22	2.84	.791	------	.512	.135			
May 18									
0:56 p	67-07	1.09	1.434	------	.818	.110		483	
1:02 p	66-21	1.09	1.432	1.047	*.812*	.100			
2:14 p	55-14	1.22	1.386	*.982*	.774	.090			
2:18 p	54-20	1.24	1.354	.975	*.770*	.110			
3:18 p	43-10	1.46	1.271	.886	*.718*	.090			
3:24 p	42-02	1.49	1.258	*.886*	.700	.085			
4:16 p	32-08	1.88	1.157	*.844*	.685	.090			
4:20 p	31-16	1.92	1.131	.842	*.683*	.100	4		54.0
May 20									
2:15 a	55-49	1.21	1.251	*.890*	.716	.130		567	
2:10 a	56-38	1.20	1.250	.890	*.716*	.120			
0:34 a	70-20	1.06	1.340	.878	*.702*	.090			
0:28 a	70-42	1.06	1.328	*.876*	.700	.095			
2:04 p	57-50	1.18	1.310	*.926*	.730	.120			
2:08 p	57-18	1.19	1.296	.928	*.730*	.125			
May 23									
3:44 a	38-49	1.59	1.265	*.909*	.718	.080	4	309	58.0
3:38 a	40-00	1.56	1.267	.908	*.722*	.085			
3:26 a	42-26	1.48	1.280	.909	*.724*	.090			
3:21 a	43-24	1.45	1.301	*.916*	.726	.080			
2:54 a	48-30	1.33	1.329	*.937*	.747	.095			Cl.
2:48 a	49-46	1.30	1.336	.960	*.748*	.095			
2:32 a	52-34	1.26	1.364	*.965*	.747	.080			Cl.
2:14 a	56-02	1.20	1.388	*.965*	.758	.075			
0:36 a	70-11	1.06	1.433	*.965*	.742	.058			
0:25 a	70-58	1.06	1.388	.992	------	------			
0:09 a	71-38	1.05	1.434	------	.753	.068			
0:44 p	70-19	1.06	1.422	------	.769	.087			
0:52 p	69-22	1.07	1.433	.983	------	------			
1:08 p	67-22	1.09	1.413	------	.729	.040			
4:24 p	31-47	1.90	1.183	------	.685	.075			
4:30 p	30-50	1.94	1.146	.859	------				
May 24									
5:47 a	15-20	3.75	.694	------	.457	.105		588	
5:37 a	17-13	3.35	.720	.568	*.477*	.120			
5:30 a	18-33	3.12	.745	*.579*	.486	.120			
5:02 a	23-54	2.46	.854	*.650*	.535	.130			
4:54 a	25-33	2.31	.896	.678	*.556*	.125			
4:37 a	28-44	2.08	.971	------	.579	.110	5		46.9
3:43 a	39-47	1.56	1.105	------	.635	.125			
3:38 a	40-51	1.52	1.126	.807	------	------			
0:23 a	71-17	1.05	1.273	------	.745	.180			
May 25									
5:00 a	24-30	2.41	.863	------	.560	.145		890	
4:44 a	27-24	2.17	.930	.699	------	------	4		55.6
3:54 a	37-08	1.64	1.054	------	.624	.145			
3:49 a	38-11	1.62	1.060	.777	*.625*	.145			
3:32 a	41-24	1.51	1.080	.791	.633	.145			
3:29 a	42-13	1.49	1.092	------	.634	.145			
0:40 a	70-08	1.06	1.193	------	.646	.145			
0:36 a	70-34	1.06	1.202	.827	------	------			
May 26									
4:12 a	33-47	1.78	1.085	*.813*	.663	.135	4	292	55.9
4:08 a	34-29	1.76	1.090	.840	*.664*	.135			
3:08 a	46-11	1.39	1.222	.869	*.684*	.110			
3:04 a	46-57	1.37	1.224	*.872*	.685	.110			
3:12 p	45-32	1.38	1.226	------	.678	.105			
3:14 p	44-57	1.40	1.221	.860	------	------			
4:16 p	33-02	1.83	1.129	.810	*.638*	.085			
4:20 p	32-21	1.86	1.132	*.808*	.639	.080			
May 27									
4:22 a	31-53	1.88	1.093	.804	*.635*	.100	4	309	55.0
4:19 a	32-33	1.85	1.112	*.810*	.639	.090			
3:42 a	39-38	1.56	1.166	.838	*.661*	.105			

POSITIONS AND AREAS OF SUN SPOTS

[Communicated by Capt. J. F. Hellweg, Superintendent United States Naval Observatory. Data furnished by Naval Observatory, in cooperation with Harvard, Yerkes, Perkins, and Mount Wilson Observatories. The differences of longitude are measured from central meridian, positive west. The north latitudes are plus. Areas are corrected for foreshortening and are expressed in millionths of sun's visible hemisphere. The total area, including spots and groups, is given for each day in the last column]

Date	Eastern standard civil time	Heliographic: Diff. long.	Heliographic: Longitude	Heliographic: Latitude	Area: Spot	Area: Group	Total area for each day
1932	*H m*	°	°	°			
May 1 (Yerkes Observatory)			No spots				
May 2 (Naval Observatory)	10 14		No spots				
May 3 (Naval Observatory)	10 9		No spots				
May 4 (Naval Observatory)	11 14		No spots				
May 5 (Naval Observatory)	10 57		No spots				
May 6 (Naval Observatory)	11 58		No spots				
May 7 (Naval Observatory)	10 48	−83.0	260.5	−7.0	185		185
May 8 (Perkins Observatory)	16 56	−69.0	257.8	−7.5		45	45
May 9 (Mount Wilson)	13 25	−54.0	261.5	−8.0	127		127
May 10 (Yerkes Observatory)	10 43	−41.0	262.8	−7.5	148		148
May 11 (Mount Wilson)	14 0	−26.0	262.8	−8.0	106		106
May 12 (Yerkes Observatory)	12 29	−13.5	262.9	−7.6	116		116
May 13 (Naval Observatory)	13 27	0.0	262.7	−8.0	108		108
May 14 (Naval Observatory)	11 38	−60.0	190.4	+5.0		31	
		−36.0	214.4	+13.0		46	
		+13.0	263.4	−8.0	93		170
May 15 (Naval Observatory)	11 28	−46.0	191.3	+6.0		123	
		+26.0	263.3	−8.0	123		246
May 16 (Naval Observatory)	13 19	−73.0	150.0	+12.0		401	
		−29.0	194.0	+7.0		93	
		+41.0	264.0	−8.0		123	617
May 17 (Perkins Observatory)	10 55	−58.5	152.6	+12.0		124	
		−11.0	200.1	+10.0		98	
		+53.0	264.1	−4.0	45		267
May 18 (Naval Observatory)	10 18	−47.0	151.3	+11.0		401	
		−7.0	191.3	+8.0		31	
		0.0	198.3	+6.0	123		
		+67.0	265.3	−8.0		15	570
May 19 (Naval Observatory)	12 18	−33.0	150.9	+11.0		370	
		+9.0	192.9	+8.0		25	
		+15.0	198.9	+6.0	123		518
May 20 (Naval Observatory)	10 41	−76.0	95.6	+4.0	401		
		−21.0	150.6	+10.0		370	
		+28.0	199.6	+6.0	123		894
May 21 (Naval Observatory)	10 23	−64.0	94.5	+4.0	401		
		−8.0	150.5	+10.0		370	
		+41.0	199.5	+6.0	123		894
May 22 (Naval Observatory)	11 51	−50.0	94.5	+4.0	309		
		+7.0	151.5	+10.0		309	
		+56.0	200.5	+6.0	93		711
May 23 (Naval Observatory)	11 44	−37.0	94.9	+4.0	309		
		+19.0	150.9	+10.0		247	
		+68.0	199.9	+6.0	62		618
May 24 (Naval Observatory)	10 50	−24.0	94.6	+4.0	278		
		+31.0	149.6	+10.0		216	494
May 25 (Naval Observatory)	10 57	−10.0	95.3	+4.0	247		
		+46.0	151.3	+10.0		154	401
May 26 (Naval Observatory)	11 4	+3.0	95.0	+4.0	247		
		+60.0	152.0	+10.0		93	340
May 27 (Naval Observatory)	10 8	+17.0	96.3	+4.0	216		
		+72.0	151.3	+10.0		77	293
May 28 (Naval Observatory)	10 29	+31.0	96.8	+4.0	216		216
May 29 (Naval Observatory)	11 47	+45.0	96.9	+4.0	216		216
May 30 (Naval Observatory)	10 32	+58.0	97.3	+4.0	216		216
May 31 (Naval Observatory)	10 29	+70.0	96.1	+4.0	185		185
Mean daily area for May							281

PROVISIONAL SUN-SPOT RELATIVE NUMBERS FOR MAY, 1932

(Dependent alone on observations at Zurich and its station at Arosa)

[Data furnished through the courtesy of Prof. W. Brunner, University of Zurich, Switzerland]

May, 1932	Relative numbers	May, 1932	Relative numbers	May, 1932	Relative numbers
1	8	11	9	21	30
2	0	12	9	22	*a* 31
3	0	13	8	23	31
4	0	14	Eac 25	24	34
5	0	15	36	25	23
6	0	16	d 35	26	a 22
7	d 8	17	41	27	18
8		18	40	28	17
9	14	19	a 27	29	
10	8	20	d 38	30	10
				31	8

Mean: 29 days=18.0

a=Passage of an average-sized group through the central meridian.
b=Passage of a large group or spot through the central meridian.
c=New formation of a center of activity: E, on the eastern part of the sun's disk; W, on the western part; M, in the central zone.
d=Entrance of a large or average-sized center of activity on the east limb.

AEROLOGICAL OBSERVATIONS

[The Aerological Division, W. R. Gregg in charge]

By L. T. SAMUELS

Free-air temperatures during the month averaged mostly above normal at the northern stations and below normal at the southern stations. The largest positive departures occurred at Ellendale and Omaha. Negative departures at the southern stations were small in practically all cases, the largest values occurring at San Diego.

Relative humidity departures were of opposite sign to those of temperature at the southern stations and at Omaha but were mostly of the same sign as those for temperature at the other northern stations. The largest positive departures occurred at Dallas.

Resultant free-air wind velocity, particularly at the southern stations, averaged in general below normal during the month. Resultant directions had in most cases a greater southerly component than normal at the northern stations and a greater than normal northerly component at the southern stations.

Airplane observations were made at the four Weather Bureau stations on every day during the month and averaged above 5,000 meters at all stations. The highest single flight reached 6,421 meters at Omaha on the 1st.

Kite flying was permanently discontinued at the close of the month at Due West incidental to the closing of this station in June.

TABLE 1.—*Free-air temperatures, and relative humidities, during May, 1932*

TEMPERATURE (° C.)

Altitude (meters) m. s. l.	Chicago, Ill. (190 meters) [1]		Cleveland, Ohio (245 meters) [1]		Dallas, Tex. (149 meters) [2]		Due West, S. C. (217 meters)		Ellendale, N. Dak. (444 meters)		Hampton Roads, Va. (2 meters) [3]		Omaha, Nebr. (299 meters) [4]		Pensacola, Fla. (2 meters) [3]		San Diego, Calif. (9 meters) [3]		Washington, D. C. (2 meters) [3]	
	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal
Surface	11.9	------	10.5	------	17.8	------	19.7	−0.5	14.1	+1.0	17.5	−1.2	13.4	------	21.3	−1.2	17.3	−1.3	15.5	−2.5
500	13.6	+0.2	12.5	−0.9	19.8	+0.7	17.1	−0.6	13.7	+1.0	16.0	−1.9	14.1	−1.0	20.1	−0.4	12.6	−2.1	15.2	−0.3
1,000	12.4	+2.1	11.6	+1.3	18.1	+1.5	14.3	−0.5	11.2	+1.7	14.2	−1.5	14.5	+2.5	17.2	−0.6	12.8	−1.6	14.2	+1.0
1,500	9.6	+2.1	8.6	+1.1	15.0	+0.3	11.2	−0.5	9.0	+2.4	------	------	12.5	+3.3	------	------	------	------	------	------
2,000	6.7	+1.7	5.7	+0.7	11.8	−0.5	8.4	−0.4	6.5	+2.9	8.1	−1.8	10.0	+3.4	12.1	−0.3	9.0	−2.6	9.6	+1.4
2,500	3.8	+1.2	2.8	+0.2	9.1	−0.5	5.6	−0.4	3.8	+3.1	------	------	7.0	+3.1	------	------	------	------	------	------
3,000	0.8	+0.8	0.1	+0.1	6.5	−0.1	2.8	−0.2	1.0	+3.1	3.1	−0.8	3.9	+2.9	7.1	−0.1	4.4	−0.9	4.0	+1.3
4,000	−5.0	+0.7	−6.3	−0.6	0.1	−0.3	−3.0	+0.1	−4.6	+3.4	------	------	−3.3	+1.5	------	------	------	------	−1.4	+1.9
5,000	−11.6	+0.1	−13.1	−1.4	−6.8	−1.5	−10.4	−0.4	−9.4	+4.7	------	------	−10.4	+0.3	------	------	------	------	------	------
RELATIVE HUMIDITY (PER CENT)																				
Surface	74	------	83	------	86	------	69	+4	68	+8	72	+3	78	------	80	+1	72	+4	69	+5
500	64	−1	71	+6	73	0	69	+4	68	+8	68	+9	72	+8	74	+1	82	+6	60	+1
1,000	58	−6	64	0	69	0	68	+4	65	+6	63	+9	63	+1	68	+3	65	+5	51	−5
1,500	58	−4	64	+2	68	+10	65	+1	64	+4	------	------	60	−2	------	------	------	------	------	------
2,000	55	−3	63	+5	67	+18	61	−1	64	+4	61	+10	57	−3	58	+6	52	+16	51	−5
2,500	55	+3	60	+8	61	+16	56	−3	64	+5	------	------	56	−2	------	------	------	------	------	------
3,000	56	+8	57	+9	55	+10	50	−5	66	+9	57	+5	54	−4	52	+11	35	+9	51	−1
4,000	51	+6	51	+6	48	+2	44	−8	67	+14	------	------	51	−8	------	------	------	------	43	−6
5,000	46	+2	46	+2	45	−8	38	−12	66	+15	------	------	47	−15	------	------	------	------	------	------

[1] Normals for Royal Center, Ind., used; surface departures omitted because of difference in time between current airplane observations and those of kites at Royal Center, Ind.
[2] Temperature departures based on normals determined by interpolating between those of Groesbeck, Tex., and Broken Arrow, Okla.
[3] Naval air stations.
[4] Normals for Drexel, Nebr., used; surface departures omitted because of difference in time between current airplane observations and those of kites at Drexel, Nebr.
Humidity departures based on normals of Groesbeck, Tex.
Surface departures omitted because of difference in time of current airplane observations and those of kites at Groesbeck and Broken Arrow.

TABLE 2.—*Free-air resultant winds (meters per second) based on pilot balloon observations made near 7 a. m. (E. S. T.) during May, 1932*

[Wind from N=360; E=90, etc.]

Altitude (meters) m. s. l.	Albuquerque, N. Mex. (1,528 meters)		Bismarck, N. Dak. (518 meters)		Brownsville, Tex. (12 meters)		Burlington, Vt. (132 meters)		Cheyenne, Wyo. (1,873 meters)		Chicago, Ill. (198 meters)		Cleveland, Ohio (245 meters)		Dallas, Tex. (154 meters)		Due West, S. C. (217 meters)		Havre, Mont. (762 meters)		Jacksonville, Fla. (14 meters)		Key West, Fla. (11 meters)	
	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity
	°		°		°		°		°		°		°		°		°		°		°		°	
Surface	35	0.8	52	1.5	135	2.1	193	1.9	291	2.7	254	1.6	180	1.3	105	0.6	25	1.0	189	0.5	111	0.1	93	1.5
500	------	------	------	------	145	7.6	236	3.0	------	------	241	6.0	233	3.2	147	4.4	50	0.9	------	------	57	0.7	101	3.1
1,000	------	------	135	1.0	141	6.2	291	4.0	------	------	254	5.3	271	4.3	175	4.6	325	1.7	219	1.7	160	0.6	135	2.4
1,500	------	------	208	1.7	151	3.7	307	6.8	------	------	265	5.5	275	5.5	201	3.9	294	1.4	269	2.7	191	1.3	195	1.6
2,000	204	0.5	253	1.9	160	0.7	313	7.3	273	3.3	256	5.3	277	6.2	247	1.8	269	2.1	284	3.9	238	1.2	204	2.3
2,500	260	2.6	270	4.5	306	1.3	308	7.5	262	4.4	275	4.2	291	6.4	328	2.0	277	2.7	278	4.8	256	0.9	214	3.2
3,000	256	4.1	281	6.0	316	3.2	304	6.3	272	5.3	273	3.7	282	8.2	341	2.8	292	3.5	261	5.5	138	0.5	219	2.4
4,000	245	6.5	288	7.6	310	5.5	308	4.2	283	5.0	------	------	296	8.5	329	3.8	291	3.7	263	7.9	279	1.6	270	3.7
5,000	235	8.7	------	------	316	9.6	------	------	275	5.6	------	------	311	10.8	330	6.0	278	4.5	258	9.2	253	4.9	352	3.6

TABLE 2.—*Free-air resultant winds (meters per second) based on pilot balloon observations made near 7 a. m. (E. S. T.) during May, 1932*—Continued

[Wind from N=360; E=90, etc.]

	Los Angeles, Calif. (217 meters)		Medford, Oreg. (410 meters)		Memphis, Tenn. (85 meters)		New Orleans, La. (25 meters)		Oakland, Calif. (8 meters)		Oklahoma City, Okla. (402 meters)		Omaha, Nebr. (299 meters)		Phoenix, Ariz. (356 meters)		Salt Lake City, Utah (1,294 meters)		Sault Ste. Marie, Mich. (198 meters)		Seattle, Wash. (14 meters)		Washington, D. C. (10 meters)	
	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity
	°		°		°		°		°		°		°		°		°		°		°		°	
Surface	108	0.6	300	0.4	78	0.4	55	1.4	239	2.0	154	2.3	146	1.8	99	1.6	147	2.6	61	0.6	161	0.5	331	1.0
500	107	1.2	303	0.8	129	1.8	106	3.4	268	2.3	167	3.8	197	4.2	208	0.4	------	------	229	0.7	243	0.2	304	3.7
1,000	357	1.9	318	0.9	240	1.5	132	1.0	319	4.5	190	6.3	235	6.8	262	2.4	------	------	271	3.8	219	1.2	317	4.0
1,500	291	2.0	199	0.8	258	2.5	139	0.6	321	4.3	221	5.0	252	6.3	247	1.8	168	4.2	282	5.8	212	1.7	308	4.4
2,000	289	3.9	249	1.4	256	1.8	200	1.2	311	4.5	258	3.6	261	6.0	214	2.9	181	3.9	277	5.6	240	1.4	302	6.4
2,500	288	2.8	257	3.5	282	1.6	332	0.9	319	5.0	298	2.4	272	6.0	201	4.2	207	3.0	299	6.4	229	3.3	291	7.3
3,000	294	4.1	269	3.9	331	1.7	310	0.8	322	6.8	314	2.9	284	7.1	209	6.2	228	4.0	314	8.2	236	4.8	292	8.6
4,000	------	------	279	6.1	341	5.5	286	3.4	------	------	------	------	275	6.7	215	7.9	257	4.8	330	13.6	------	------	325	5.8

RIVERS AND FLOODS

By MONTROSE W. HAYES

[In charge River and Flood Division]

In May there were floods of minor importance in the Potomac, James, and Savannah Rivers along the Atlantic slope, the Barren, Green, and Pigeon Rivers in the Ohio Basin and in some of the rivers of New Mexico, Idaho, and Washington. There was a moderate flood in the Colorado River, caused by melting snow; it did not cause any loss of consequence. Heavy rains in Nebraska on the night of the 6th–7th caused a flood in the Elkhorn River, a small tributary to the Platte. No flood service is maintained on the Elkhorn.

Table of flood stages in May, 1932

[All dates in May unless otherwise specified]

River and station	Flood stage	Above flood stages—dates		Crest	
		From—	To—	Stage	Date
ATLANTIC SLOPE DRAINAGE					
Potomac:	*Feet*			*Feet*	
Harpers Ferry, W. Va	18	13	14	20.0	13
Sycamore Island, Md	10	13	15	14.6	14
James: Columbia, Va	10	3	4	13.9	3
		12	15	12.2	13
Savannah: Ellenton, S. C	14	4	5	15.3	5
MISSISSIPPI SYSTEM					
Ohio Basin					
Barren: Bowling Green, Ky	20	1	2	23.0	1
Green: Lock 4, Woodbury, Ky	33	1	2	34.6	2
Pigeon: Newport, Tenn	6	1	1	8.0	1
Atchafalaya Basin					
Atchafalaya: Atchafalaya, La	22	Dec. 27	5	24.9	Mar. 3–5
WEST GULF OF MEXICO DRAINAGE					
Pecos: Fort Sumner, N. Mex	5	11	12	5.5	12
Rio Grande:					
Espanola, N. Mex	7	16	29	7.8	20–22, 24, 25
San Marcial, N. Mex	7	22	28	7.3	23
GULF OF CALIFORNIA DRAINAGE					
North Fork: Paonia, Colo	9	12	20	9.7	13
		22	22	9.2	22
Gunnison: Delta, Colo	9	12	26	10.2	23
Green: Elgin, Utah	12	24	27	12.3	27
Colorado:					
Fruita, Colo	12	24	24	12.0	24
Parker, Ariz	7	1	(1)	12.0	30–31
PACIFIC SLOPE DRAINAGE					
Columbia Basin					
Clearwater: Kamiah, Idaho	12	8	23	15.6	14
Columbia:					
Marcus, Wash	24	7	(1)	31.8	27
Vancouver, Wash	15	10	(1)	21.6	25

(1) Continued into June.

The passing of the Atchafalaya River below the flood stage on May 5 brought an end to the numerous and serious floods which prevailed in the tributary streams of the lower Mississippi Basin during the preceding five months.

Statement of flood losses

[The losses in the lower Mississippi Basin were in the winter and early spring; the others were in May]

MISSISSIPPI SYSTEM

Missouri Basin-Elkhorn River in Nebraska

Tangible property totally or partially destroyed	$25,400
Prospective crops	2,500
Livestock and other movable property	1,100

Ohio Basin-Barren River in Kentucky

Prospective crops	5,000

Lower Mississippi Basin-Tallahatchie and Yazoo Rivers

Tangible property totally or partially destroyed	750,000
Matured crops	500,000
Livestock and other movable property	25,000
Suspension of business, including wages of employees	175,000

Atchafalaya Basin

Tangible property, totally or partially destroyed	6,210
Matured crops	1,725
Prospective crops	49,450
Livestock and other movable property	500

WEST GULF OF MEXICO DRAINAGE

Rio Grande River in New Mexico

Tangible property, totally or partially destroyed	10,000

GULF OF CALIFORNIA DRAINAGE

Colorado River

Tangible property, totally or partially destroyed	250

Estimated value of property saved by warnings:

Barren River in Kentucky	1,000
Green River in Kentucky	100
Tallahatchie and Yazoo Rivers in Mississippi, in the winter and late spring	50,000

WEATHER OF THE ATLANTIC AND PACIFIC OCEANS

The Marine Division, W. F. McDONALD in Charge

NORTH ATLANTIC OCEAN

By F. A. YOUNG

The pressure situation.—As shown in Table 1 the largest departures from the monthly normal pressure occurred at Reykjavik and Lerwick, where they were +0.20 inch and +0.13 inch, respectively, indicating that the Icelandic LOW was weaker than usual during the greater part of the month. From the 1st to the 5th an area of low pressure covered the region usually occupied by the North Atlantic HIGH, but thereafter this center of action was reestablished and reached its greatest intensity from the 20th to 26th.

During the first decade of the month the pressure in the Caribbean Sea was considerably below the monthly normal. As indicated by reports received from a number of vessels there was a moderate LOW in the Gulf of Mexico from the 16th to 19th, accompanied by heavy rain squalls, with highest force of wind, 9, as shown by report of American steamship *Standard* in table of gales and storms.

Table 1 shows that the departures were small at Halifax and Belle Isle, and while at both of these stations there were rapid changes in pressure from day to day, they were not as pronounced as in previous months.

TABLE 1.—*Averages, departures, and extremes of atmospheric pressure (sea level) at selected stations for the North Atlantic Ocean and its shores, May, 1932*

Stations	Average pressure	Departure	Highest	Date	Lowest	Date
	Inches	*Inch*	*Inches*		*Inches*	
Julianehaab, Greenland [1]	30.16	(2)	30.59	3	29.81	21
Reykjavik, Iceland [1]	30.12	+0.20	30.70	4	29.58	14
Lerwick, Shetland Islands [1]	29.93	+0.13	30.23	3	29.54	13
Valencia, Ireland [1]	29.86	−0.09	30.17	4	29.53	1
Lisbon, Portugal [1]	30.08	+0.11	30.37	22	29.54	6
Madeira [1]	30.08	+0.07	30.28	22	29.52	5
Horta, Azores [1]	30.12	−0.04	30.52	23	29.61	4
Belle Isle, Newfoundland [1]	29.91	−0.03	30.28	1	29.48	27
Halifax, Nova Scotia [1]	29.97	0.00	30.30	19	29.70	14
Nantucket [3]	30.03	+0.04	30.42	19	29.62	13
Hatteras [3]	30.05	+0.04	30.29	25	29.67	12
Bermuda [1]	30.11	0.00	30.32	26	29.74	9
Turks Island [1]	30.00	0.00	30.14	21	29.76	7
Key West [3]	29.97	0.00	30.10	25	29.84	1
New Orleans [3]	29.98	+0.01	30.19	3	29.68	20
Cape Gracias, Nicaragua [1]	29.86	−0.04	29.94	13	29.76	6

[1] All data based on a. m. observations only, with departures compiled from best available normals related to time of observations.
[2] No normal available.
[3] Corrected 24-hour means, based on more than 1 observation.

Cyclones and gales.—Over the eastern section of the steamer lanes the number of days with gales was not far from the normal, as shown on the Pilot Chart; these ranged in force from 8 to 10, and the greatest number occurred in the square between the forty-fifth and fiftieth parallel and the thirtieth and thirty-fifth meridians, where they were reported on 7 days. Gales were not reported on more than 2 days in any one square west of the forty-fifth meridian, although there was considerable cyclonic activity in the vicinity of the Bermudas, from the 8th to 10th, while similar conditions prevailed west of the Azores, as far as the fortieth meridian, on the 1st, 10th, and 16th.

The stormiest period over the eastern section of the northern steamer lanes was from the 9th to 12th although gales were also reported from that region from the 15th to 17th and the 28th to 31st of the month.

Trans-Atlantic flights.—On the 13th aviator Lou Reichers was rescued from his plane by a boat crew from the American steamship *President Roosevelt*, Capt. George Fried. The plane was on a flight from Harbor Grace, Newfoundland, to Dublin and Paris, and fell into the sea when 47 miles from Fastnet Light, where it was sighted from the bridge of the *Roosevelt*. Captain Fried maneuvered his ship toward the plane and a lifeboat in charge of Chief Officer Henry Manning was launched and succeeded in rescuing Pilot Reichers, although, as a heavy sea was running, the plane had to be abandoned. Chart VIII shows the conditions at Greenwich mean noon on May 13.

On May 21, Mrs. Amelia Earhart Putnam made her solo flight from Harbor Grace to near Londonderry, Ireland, making the crossing in 15 hours and 23 minutes.

The German plane *Do–X* left Harbor Grace on May 21 and arrived at Southampton, England, via Horta and Vigo on the 23d. Charts IX to XI cover the period from the 21st to the 23d, inclusive.

Fog.—Fog was very prevalent over the ocean west of the forty-fifth meridian, and the number of days on which it was reported in different sections is as follows: Over the Grand Banks, from 13 to 16 days; along the American coast north of the thirty-fifth parallel, from 7 to 15 days; over the region between the fortieth and fiftieth parallel and the twenty-fifth and fiftieth meridians, from 1 to 9 days; along the coast of Europe, from 2 to 3 days; between the Bermudas and American coast, from 1 to 3 days.

OCEAN GALES AND STORMS, MAY, 1932

Vessel	Voyage		Position at time of lowest barometer		Gale began	Time of lowest barometer	Gale ended	Lowest barometer	Direction of wind when gale began	Direction and force of wind at time of lowest barometer	Direction of wind when gale ended	Direction and highest force of wind	Shifts of wind near time of lowest barometer
	From—	To—	Latitude	Longitude									
NORTH ATLANTIC OCEAN			° ′	° ′				*Inches*					
Winnebago, Br. S. S.	New York	London	47 53 N	30 28 W	Apr. 30	Noon, May 1.	May 1	29.44	NNW.	NW, 8	NW.	NW, 8	Steady.
Changuinola, Br. S. S.	Off Cape Hatteras.	Rotterdam	44 28 N	37 29 W	May 1	11 a, 2	May 2	29.48	NNW.	W, 7	W.	WNW, 9	
West Madaket, Am. S. S.	Liverpool	Pensacola	39 00 N	30 00 W	May 3	4 p, 3	May 4	29.51	SW.	SW, 5	NNW.	WNW, 9	
Executive, Am. S. S.	New York	Mediterranean.	40 24 N	54 10 W	do	8 a, 4	do	29.45	SSW.	SSW, 8	SSW.	SSW, 8	Do.
Astrida, Belg. S. S.	Bahia	Antwerp	43 10 N	9 42 W	May 4	2 a, 5	May 6	29.38	NE.	ENE, 10	ENE.	ENE, 10	
Caraboba, Am. S. S.	New York	La Guaira	29 00 N	69 45 W	May 7	1 a, 7	May 8	29.62	E.	E, 6	NW.	NW, 9	E-NE.
Dominica, Br. S. S.	do	St. Thomas	26 32 N	67 32 W	do	7 a, 8	do	29.45	ENE.	SE, 7	SW.	NE, 9	ESE-SSW.
Lekhaven, Du. S. S.	Pensacola	Bremen	41 40 N	43 30 W	May 8	—, 8	May 9	29.37	W.	W, 8	W.	W, 8	Steady.
Manistee, Br. S. S.	Tela	Bremerhaven	40 50 N	46 20 W	do	4 a, 9	do	29.57	SW.	WNW, 8	SW.	WNW, 8	WSW-WNW.
Emile Francqui, Belg. S. S.	Antwerp	New York	45 20 N	33 00 W	May 9	8 p, 9	May 10	29.43	WSW.	WSW, 10	NNW.	WSW, 10	SW-WNW.
Steel Worker, Am. S. S.	Port Said	New Orleans	36 31 N	42 20 W	do	3 a, 10	do	29.56	S.	SSW, 8	NW.	S, 10	SSW-WSW.
Berlin, Ger. S. S.	English Channel.	New York	45 55 N	35 50 W	do	5 p, 10	May 11	29.18	SSE.	SW, 8	NW.	SW, 9	SW-WSW.
West Gambo, Am. S. S.	Rotterdam	Tampa	42 20 N	33 30 W	do	2 p, 10	do	29.19	SW.	NW, 7	W.	SW, 9	S-W-WNW.
Collamer, Am. S. S.	Bordeaux	New York	46 00 N	24 00 W	May 10	Mdt, 10	do	29.34	SSW.	SSW, 9	W.	SSW, 9	SSW-W.
Florida II, Ital. S. S.	Genoa	Pensacola	27 15 N	63 05 W	do	3 a, 10	May 10	29.42	NW.	SSW, 7	NW.	NW, 9	S-W-NW.
Arizpa, Am. S. S.	Antwerp	Panama City, Fla.	40 53 N	26 54 W	do	5 a, 11	May 11	29.63	SSW.	S, 9	W.	S, 9	S-W-N.
Hoxie, Am. S. S.	Boston	Manchester	50 06 N	20 02 W	do	4 a, 11	do	29.44	S.	S, 8	SW.	S, 8	S-SW.
Pipestone County, Am. S. S.	Havre	New York	48 45 N	22 45 W	May 11	4 a, 12	May 14	29.33	SSW.	SW, 7	NW.	WSW, 8	SSW-W-NW.
Do	do	do	43 56 N	41 30 W	May 16	4 a, 16	May 16	29.60	WSW.	WSW, 6	NW.	NW, 9	WSW-NW.
Winnebago, Br. S. S.	London	do	47 47 N	33 31 W	do	10 p, 16	May 17	29.14	NNW.	NW, 6	NNW.	NNW, 9	W-NNW.
Wilhelm A. Riedemann, Danzig M. S.	Canal Zone	Southampton.	39 45 N	38 53 W	do	Noon, 16	do	20.83	SW.	W, 7	W.	W, 9	SW-NW-W.
Do	do	do	43 40 N	30 00 W	May 18	2 p, 18	May 20	29.72	NW.	NNW, 7	NW.	NW, 9	NNW-NW.
Changuinola, Br. S. S.	Swansea	Kingston	46 45 N	16 43 W	May 17	5 a, 18	May 18	29.54	SSW.	SW, 8	WSW.	SW, 8	SSW-SW.
Standard, Am. S. S.	Mississippi River.	New York	28 53 N	89 26 W	May 19	Noon, 19	May 19	29.64	NNW.	NNW, 9	NW.	NNW, 9	Steady.
Tiger, Nor. S. S.	Baytown	Trondheim	52 00 N	34 00 W	May 21	2 a, 21	May 22	29.44	S.	S, 2	WNW.	NW, 9	S-NW.
Europa, Ger. S. S.	Cherbourg	New York	49 25 N	15 34 W	May 22	Noon, 22	do	30.01	W.	W, 8	WNW.	WNW, 8	
Sinaia, Fr. S. S.	Lisbon	Providence	38 30 N	59 47 W	May 23	8 a, 23	May 23	29.67	SSW.	SW, 9	NW.	SW, 9	
Hoxie, Am. S. S.	Cork	Boston	47 12 N	32 38 W	May 28	1 p, 28	May 29	29.78	SSE.	S, 7	WNW.	W, 8	SSE-WSW-WNW.
Aquitania, Br. S. S.	Southampton.	New York	48 20 N	24 40 W	May 30	9 a, 30	May 30	29.48	SW.	WNW, 7	NW.	WNW, 8	WSW-WNW.
Winnebago, Br. S. S.	New York	Manchester	44 48 N	41 09 W	May 31	8 p, 31	June 3	30.00	SW.	WSW, 8	NNW.	WNW, 9	S-W-WNW.
NORTH PACIFIC OCEAN													
Melville Dollar, Am. S. S.	Seattle	Yokohama	47 01 N	165 11 E	Apr. 30	Noon, 30	May 1	29.09	SE.	S, 8	N.	NW, 10	SE-S-SW.
Crown City, Am. M. S.	Durban, S. A.	Hong Kong	10 00 N	112 00 E	May 2	a. m., 3	May 3	[1] 28.56	NW.	W, 12	SE.	W, 12	NW-W.
Toba Maru, Jap. S. S.	Yokohama	San Francisco.	44 25 N	152 30 W	May 3	2 a, 4	May 4	29.27	SSE.	SSW, 8	SW.	SSW, 8	4 pts.
City of Victoria, Can. S. S.	Japan	Vancouver	50 19 N	142 50 W	May 4	4 p, 4	May 5	29.13	SW.	SW, 7	SW.	SW, 8	S-SSW.
Hakonesan Maru, Jap. M. S.	Yokohama	San Francisco.	36 08 N	145 04 W	May 6	6 p, 6	May 7	29.58	SSW.	SW, 5	NNW.	N, 8	S-SW-W.
Hakubasan Maru, Jap. M. S.	Tacoma	Yokohama	46 10 N	154 50 E	May 7	8 p, 7	May 8	[1] 29.09	SE.	W, 8	WNW.	NW, 9	1 pt.
Soyo Maru, Jap. M. S.	San Francisco.	do	47 04 N	178 30 W	May 9	2 a, 8	May 10	29.67	W.	S, 6	W.	W, 9	S-W.
Do	do	do	40 09 N	152 20 E	May 14	6 a, 14	May 14	29.38	W.	W, 8	NNW.	NW, 10	W-NW.
Pres. Taft, Am. S. S.	Yokohama	Seattle	49 13 N	179 19 W	May 12	2 p, 12	May 12	29.25	SE.	SSE, 8	SW.	ESE, 9	SE-SSE.
Potter, Am. M. S.	Shanghai	San Pedro	40 55 N	160 00 E	May 14	10 p, 14	May 15	29.51	SW.	NNW, 7	NW.	NNW, 8	SW-NNW.
Grays Harbor, Am. S. S.	Everett	Yokohama	50 17 N	178 05 E	May 16	6 a, 16	May 16	29.56	ESE.	ESE, 6	N.	E, 8	E-NE.
Do	do	do	42 20 N	150 30 E	May 23	3 a, 23	May 23	29.49	SE.	SSE, 8	SSE.	SSE, 8	Steady.
Shelton, Am. S. S.	Taku Bar	Los Angeles	48 56 N	178 30 W	May 22	4 a, 22	May 24	29.61	NNE.	ENE, 6	W.	WNW, 9	ENE-NE.
Do	do	do	47 39 N	161 07 W	May 25	Noon, 25	May 26	29.49	SE.	S, 7	S.	SE, 8	SW-S-SSE.
Oridono Maru, Jap. S. S	Miike	do	46 25 N	176 02 W	May 24	2 a, 25	May 25	29.18	SE.	W, 7	N.	SE, 8	SW-W.
Do	do	do	41 44 N	139 23 W	May 31	4 p, 31	May 31	29.72	SSW.	SW, 7	WSW.	SSW, 8	SSW-SW.

[1] Barometer uncorrected.

NORTH PACIFIC OCEAN

By WILLIS E. HURD

Atmospheric pressure.—There was an unusually large range in atmospheric pressure for the season over central longitudes of the North Pacific Ocean during May, 1932, the average pressure being two-tenths of an inch below the normal over the central Aleutians, and a tenth of an inch above at Midway Island. Numerous LOWS disturbed the northern part of the ocean during the month and in effect resulted in a strong and unseasonably well developed continuation of the Aleutian cyclone, with average center at or near Dutch Harbor, where the monthly mean was 29.63 inches.

In middle latitudes the Pacific anticyclone was likewise unusually well developed for the month, and few depressions formed to disturb the region between 20° and 40° N., except in the Far East, where the usual succession of HIGHS and LOWS prevailed.

TABLE 1.—*Averages, departures, and extremes of atmospheric pressure at sea level, North Pacific Ocean and adjacent waters, May, 1932, at selected stations*

Stations	Average pressure	Departure from normal	Highest	Date	Lowest	Date
	Inches	*Inch*	*Inches*		*Inches*	
Point Barrow [1]	30.10	+0.01	30.34	1	29.86	5
Dutch Harbor [1 2]	29.63	−0.21	30.28	28	28.78	20
St. Paul [1 2]	29.67	−0.17	30.16	28	29.04	4
Kodiak [1]	29.77	−0.07	30.16	[3] 28	28.94	5
Juneau [4]	29.97	−0.02	30.44	27	29.56	5
Tatoosh Island [4 5]	30.09	+0.08	30.40	14	29.68	29
San Francisco [4 5]	29.99	0.00	30.26	22	29.74	6
Mazatlan [1 2]	29.87	−0.05	30.02	13	29.76	6
Honolulu [4]	30.08	+0.03	30.16	19	29.97	27
Midway Island [1]	30.17	+0.12	30.32	10	29.94	2
Guam [1 2]	29.88	0.00	29.98	[3] 9	29.76	17
Manila [1]	29.81	−0.04	29.92	11	29.74	[3] 14
Naha [1 2]	29.89	+0.07	30.02	16	29.68	24
Chichishima [1 2]	30.01	+0.10	30.16	18	29.86	6
Nemuro [6]			30.28	15	29.46	[3] 22

[1] Data based on 1 daily observation only, with departures computed from best available normals related to time of observation.
[2] Data for 1 to 6 days missing.
[3] And on one other date.
[4] Data based upon a. m. and p. m. observations.
[5] Corrected to 24-hour mean.
[6] Data for 21 days only; average not computed.

Cyclones and gales.—Only one cyclone of major importance is known to have occurred on the North Pacific during the month. This was the typhoon of April 29–May 5 which, after crossing the Sulu Archipelago, where it did considerable damage in April, crossed the China Sea and damaged the coast of Indo-China, with great loss to life, on May 4. The typhoon was of little width, but great intensity. It is fully described in the subjoined article by the Rev. Miguel Selga, S. J., director of the Philippine Weather Bureau. A report from the American motor ship *Crown City*, which encountered the storm on May 2 and 3 near 10° N., 112° E., shows that the vessel rode out storm to hurricane velocities (forces 11–12) from midnight until noon of the 3d.

Despite the average pressure alignment, which would seem to have resulted in an abnormal amount of storminess for May over northern waters, close to the normal percentage of gales occurred. Other than those attending the tropical cyclone, but few gales, and those not reported as exceeding force 8, occurred south of the fortieth parallel. North of this parallel, in the more disturbed parts of the ocean, scattered gales, mostly of forces 8–9, were experienced on several days, and of force 10, on two days, the 1st and 14th, these latter in the western part of the steamship routes. The heaviest gales in general were reported from middle and western localities in northern waters. On the 7th, during a strong gale, snow fell east of the Kuril Islands.

In the Gulf of Tehuantepec northers of moderate force 7 were experienced on the 2d, 14th, and 19th.

The accompanying table of gales and storms shows the complete list of winds exceeding force 7 that have been reported up to this writing as occurring during May.

Winds at Honolulu.—The prevailing wind direction at Honolulu was from the east; the maximum velocity was 29 miles from the northeast on the 15th.

Fog.—Over the main body of the ocean north of the thirtieth parallel fog increased considerably over its occurrence in April. The percentage of frequency in these latitudes, however, did not exceed 10, except north of the fortieth parallel, where in localities, particularly southeast of the Kuril Islands and at 40°–45° N., 140°–145° W., it was observed on 30 to 35 per cent of the days. Fog along the American coast was comparatively infrequent, occurring on only 2 or 3 days in United States waters. Off the west coast of the peninsula of California it was found on 6 days.

THE TYPHOON OF JOLO—INDO-CHINA, APRIL 29-MAY 5, 1932

By Rev. MIGUEL SELGA, S. J.

[Weather Bureau, Manila, P. I.]

A typhoon of considerable intensity crossed the Sulu Archipelago on April 29, causing a heavy loss of life and property.

At 6 a. m. on April 29 the barometer of Jolo was not lower than 755.70 mm; the wind was from the north, force 3 only; the sky was overcast, but no rain. As an officer of the motor ship *Rizal* anchored at Jolo expressed it, "Even until 11 o'clock a. m. everything was serene, and the sea betrayed no sign of fury." By 2 o'clock p. m. the barometer was falling at a rapid rate; the wind had increased to force 7; large waves from the north were dashing against the pier and against the numberless houses built by the Chinese close to shore and over low water. At 6 p. m. the barometer took a precipitous drop; the wind veered to north-northeast and increased to force 8. Throughout the evening until about 11 p. m. fierce winds blew over the town, ranging in velocity from 32 to 63 miles per hour. The barometric minimum, 743.17 mm, took place at 6.50 p. m.; shortly before and after that moment the wind was blowing a whole gale. Nipa roofs and houses of light materials gave in; sheets of galvanized iron were uplifted from roofs and blown away with great danger to life; houses collapsed; the telegraph and telephone lines became a mass of entangled wire; trees were uprooted, blocking roads and streets; huge waves washed away vintas, paraos, and houses along the shore. The motor ship *Rizal* pulled out from the pier and rode out the storm a mile out at sea, with two anchors and a full head of steam all the time. The steamship *Islas Filipinas*, which preferred to remain tied up at the pier, broke loose from her moorings and ran aground near the Chinese pier. The motor ship *Remedios*, which was tied up at a small wharf, also broke loose from her moorings, was literally snapped in two by the terrific buffeting of the waves, and sank with the loss of three lives. Fully three-quarters of the town of Jolo was completely demolished. In the municipal district of Jolo, whose population was estimated at 7,000 in 1932, 2,500 persons were rendered homeless and 2,835 destitute. The historic Chinese pier, extending on huge

wooden piles several hundred feet into the harbor, was wiped out, with its store shops and Chinese houses. The palace of the sultan was destroyed. The Spencer school buildings were demolished, all except the dormitory. Mrs. C. S. Spencer, a New York philanthropist, founder and administrator of the school, was seriously injured when her palatial home collapsed, and she was pinned under a teakwood post 10 inches square and weighing several hundred pounds. To liberate Mrs. Spencer from under the teak post it took four men one hour to saw through the post in the darkness, with the help of a flashlight only. "Every mine worker the world over," said Mrs. Spencer, "has now my sympathy and understanding of what it means to have your body held for hours in immovable agony with your mind perfectly active all the time."

The center of the storm very likely did not touch the island of Jolo proper, but passed over the small island of Pata, where a calm of 15 minutes was observed, and the wind shifted rapidly from north-northwest to southeast.

When the typhoon passed south of the Samales group and south of Jolo Island, it had a very strong westerly component. Inclining more to the west-northwest, it passed south of North Ubian Island shortly before midnight of the 29th and very close to and by the south of Cagayan de Sulu at 2 p. m. of the 30th. The wind, which at Cagayan de Sulu had been from the northeast the whole morning, veered to east-southeast at 2.30 p. m., to southeast at 3 p. m., and to south at 5 p. m. The strongest winds were from east-northeast between 1 p. m. and 2.30 p. m. At 4 p. m. the winds from the southeast are said to have died down to about half a gale. The mountainous waves raised by the typhoon destroyed the pier.

According to reliable information, the losses caused by the typhoon in Cagayan de Sulu were as follows: 5 lives lost; 15 persons injured, 10 commercial houses destroyed, 807 residential buildings destroyed, 104 head of cattle killed, 170,000 coconut trees bearing fruit and 100,000 not yet bearing destroyed, and about 7,000 persons homeless.

Following its west-northwest course the typhoon crossed the Balabac Strait on the evening or night of the 30th, probably very close to Banguey Island.

The diameter of the storm was so small that once the typhoon was in the China Sea the isobars of the weather map were insufficient to circumscribe its center. Manila Observatory was compelled to broadcast on May 1 that owing to lack of observations it was impossible to ascertain whether the Jolo typhoon had filled up or was still raging over the southern part of the China Sea. The observations of the ship *Atrews* copied from her log book upon arrival at Manila show that in crossing the China Sea the storm had maintained its intensity. The ship was bound from Singapore to Manila and was navigating N. 37 E. At 7.15 a. m. on May 3, the course was changed to N. 30 W., since the barometer had dropped 5 mm in the last five hours with every indication of a typhoon approaching by the north. At 8 a. m. while the ship was in latitude 9° 51′ and longitude 110° 12′, the barometer read 746.8 mm, the northwest wind increased to force 9 and the sea was running very high. From 9.30 a. m. to 5 p. m. a course to south-southwest was maintained. The barometric minimum of 742.9 was experienced at 9.30 a. m. with winds from the west, force 10. The wind backed to west-southwest, southwest, and southeast, but blew with force 10 for five hours at least. With the passing of the storm north of the ship the weather moderated and by midnight the barometer had risen to 754.9 and the south-southeast wind had abated to force 5.

Unrelenting in its strength the storm entered Cochinchina between Phanrang and Phanthiet, a few miles south of Cape Pandaran on Wednesday, May 4. A press dispatch reported over 500 victims of the storm in Annam. The Jolo typhoon will go down in history as a freak cyclone, less than 20 kilometers in diameter, traveling at a mean speed of 13 kilometers per hour, which caused the death of 147 persons in the Sulu Archipelago and of 500 at least in Indo-China. The damage to private property in the Sulu Archipelago alone amounted to 5,000,000 pesos.

CLIMATOLOGICAL TABLES

CONDENSED CLIMATOLOGICAL SUMMARY

In the following table are given for the various sections of the climatological service of the Weather Bureau the monthly average temperature and total rainfall; the stations reporting the highest and lowest temperatures, with dates of occurrence; the stations reporting the greatest and least total precipitation; and other data as indicated by the several headings.

The mean temperature for each section, the highest and lowest temperatures, the average precipitation, and the greatest and least monthly amounts are found by using all trustworthy records available.

The mean departures from normal temperatures and precipitation are based only on records from stations that have 10 or more years of observations. Of course, the number of such records is smaller than the total number of stations.

Condensed climatological summary of temperature and precipitation, by sections, May, 1932

[For description of tables and charts, see REVIEW, January, p. 37]

Section	Temperature							Precipitation					
	Section average	Departure from the normal	Monthly extremes					Section average	Departure from the normal	Greatest monthly		Least monthly	
			Station	Highest	Date	Station	Lowest	Date			Station	Amount	Station	Amount
	°F.	°F.		°F.			°F.		In.	In.		In.		In.
Alabama	70.0	−1.3	4 stations	92	[1] 8	2 stations	40	3	5.21	+1.27	Citronelle	13.20	Tuscumbia	0.48
Arizona	66.9	−0.7	Gila Bend	112	18	Alpine	14	[1] 5	0.16	−0.19	Bright Angel Ranger Station.	2.84	52 stations	0.00
Arkansas	69.5	+0.4	Warren	96	15	Thornburg	35	19	1.96	−3.15	Danville	5.01	Gravette	0.28
California	60.1	−0.3	Greenland Ranch	109	11	Twin Lakes	5	22	1.23	+0.25	Camptonville (near)	6.88	17 stations	0.00
Colorado	54.5	+2.0	Las Animas	96	[1] 18	Silverton	12	6	0.83	−1.02	2 stations	2.36	Las Animas	0.00
Florida	75.4	−0.2	Ocala	99	9	Garniers (near)	46	3	6.34	+2.32	Davie	21.26	Gainesville	1.21
Georgia	70.9	−0.7	4 stations	97	9	2 stations	37	3	3.57	+0.14	Fort Gaines	8.46	Glennville	0.85
Idaho	53.7	+0.3	Glenns Ferry	98	11	Obsidian	18	26	2.20	+0.60	Kamiah	5.02	Irwin	0.09
Illinois	64.2	+1.6	Henry	96	14	Mount Carroll	28	2	2.40	−1.54	Galva	7.03	Cairo	0.50
Indiana	62.8	+0.7	Howe	96	15	Goshen	26	2	1.38	−2.68	Notre Dame	3.99	Richmond	0.31
Iowa	62.3	+2.1	2 stations	95	14	2 stations	28	2	3.99	−0.18	Glenwood	8.43	Maquoketa (near)	1.66
Kansas	65.6	+2.3	do	95	14	3 stations	30	[1] 1	2.25	−1.40	Alden	6.01	Richfield	0.15
Kentucky	65.1	−0.2	3 stations	92	[1] 23	2 stations	33	3	1.39	−2.61	Harlan	4.05	Grayson	0.13
Louisiana	72.7	−1.0	2 stations	94	[1] 30	Tallulah	46	3	5.73	+1.21	New Orleans (No. 2)	17.22	Lake Providence	0.77
Maryland-Delaware	62.0	−0.4	do	94	26	Grantsville, Md	25	3	5.29	+1.88	State Sanatorium, Md.	7.12	Pocomoke City, Md.	2.57
Michigan	55.2	+1.4	Bay City	93	15	Wolverine	9	2	4.00	+0.81	Owosso	7.42	Luther	2.06
Minnesota	56.7	+2.4	2 stations	99	14	Wadena	21	1	3.13	+0.12	Reeds	5.32	Thief River Falls	1.00
Mississippi	70.6	−1.0	Clarksdale	95	31	West Point	41	3	3.71	−0.71	Bay St. Louis	17.84	Holly Springs	0.65
Missouri	66.1	+1.7	St. Charles	98	23	3 stations	31	2	1.91	−2.76	Gallatin	5.58	Parma	0.32
Montana	53.9	+2.4	3 stations	92	13	2 stations	20	[1] 16	1.67	−0.48	Browning	4.90	Roundup	0.57
Nebraska	62.2	+3.1	Albion	98	21	Mullen	25	1	2.84	−0.69	Butte	6.99	Potter	0.48
Nevada	56.7	−0.3	Logandale	106	15	2 stations	22	[1] 22	1.12	+0.35	Mahoney Ranger Station.	4.13	Yerington	0.05
New England	56.0	+1.0	2 stations	95	[1] 25	Millinocket, Me	19	7	1.96	−1.43	Danforth, Me	4.60	Haverhill, Mass	0.74
New Jersey	60.5	+0.4	Belvidere	94	26	Layton	29	19	2.98	−0.65	Northfield	5.61	Long Valley	1.60
New Mexico	59.6	−0.1	Orogrande	102	19	Horse Springs	9	7	1.58	+0.34	Hagerman	4.87	5 stations	0.00
New York	56.8	+1.1	Voorheesville	96	[1] 25	2 stations	22	[1] 3	2.67	−0.85	Penn Yan	5.38	Ogdensburg	1.13
North Carolina	65.7	−1.0	Fayetteville	97	8	Mount Mitchell	27	2	3.81	−0.36	Goldsboro	8.41	Asheville	0.84
North Dakota	55.9	+3.1	Westhope	98	13	10 stations	25	[1] 1	2.14	−0.26	Jamestown	4.50	Parshall	0.21
Ohio	61.6	+1.4	Middleport	95	26	Millport	24	3	1.78	−1.86	Willoughby	5.79	Eaton	0.21
Oklahoma	68.9	+1.0	Hollis	97	31	2 stations	37	[1] 1	2.18	−2.38	Tuskahoma	5.74	Kenton	0.25
Oregon	53.1	0.0	2 stations	94	[1] 12	Lake	17	[1] 15	2.13	+0.37	Wicopee	7.09	Bear Creek	0.35
Pennsylvania	59.8	+0.4	Lock Haven	98	25	Somerset	21	3	3.69	−0.21	Warren	6.40	Vandergrift	1.00
South Carolina	69.1	−1.7	2 stations	96	8	3 stations	41	[1] 3	3.35	−0.28	Summerville	8.48	Aiken	1.74
South Dakota	59.6	+3.7	Wagner	98	[1] 13	7 stations	26	[1] 1	3.33	+0.39	Harveys Ranch	5.98	Dupree	1.11
Tennessee	67.0	+0.3	5 stations	92	31	Rugby	32	3	2.14	−2.06	Embreeville	4.78	Moscow	0.41
Texas	72.8	−0.3	Booker	106	2	Clint	35	7	2.90	−0.81	Abilene	10.99	2 stations	0.00
Utah	55.9	+0.4	St. George	96	17	Great Basin Experiment Station (Alpine).	10	5	0.68	−0.56	Richmond	2.20	Emery	0.00
Virginia	63.8	−0.1	Kenbridge	96	8	Hot Springs	30	3	3.92	+0.48	Berryville	8.22	Emporia	1.10
Washington	53.7	−0.5	Hanford	91	17	3 stations	22	[1] 15	1.52	−0.66	Palmer	4.50	Port Angeles	0.10
West Virginia	62.1	+0.6	Moorefield	96	27	2 stations	24	3	3.11	−0.76	Martinsburg	6.78	Ryan	0.62
Wisconsin	56.1	+1.4	Friendship	96	15	Big St. Germain Dam.	20	2	3.07	−0.42	Ashland	5.78	Waukesha	1.16
Wyoming	51.0	+2.0	3 stations	90	[1] 13	Dome Lake	−5	7	1.77	−0.36	Dome Lake	5.29	Sage	0.00
Alaska (April)	32.8	+3.9	Ketchikan	70	30	Shishmaref	−19	9	0.85	−0.73	View Cove	10.12	6 stations	0.00
Hawaii	71.6	+0.6	Waipahu, Oahu	92	[1] 24	Kanalohuluhulu, Kauai.	46	[1] 9	7.22	+1.10	Puu Kukui (upper), Maui.	38.00	3 stations	0.00
Porto Rico	77.5	+0.6	Manati	96	23	Guineo Reservoir	49	4	12.57	+6.02	Maricao	26.85	Rio Grande	5.17

[1] Other dates also.

TABLE 1.—*Climatological data for Weather Bureau stations, May, 1932*

District and station	Elevation of instruments: Barometer above sea level	Elevation of instruments: Thermometer above ground	Elevation of instruments: Anemometer above ground	Pressure: Station, reduced to mean of 24 hours	Pressure: Sea level, reduced to mean of 24 hours	Pressure: Departure from normal	Temperature of the air: Mean max. + mean min. ÷2	Temperature of the air: Departure from normal	Temperature of the air: Maximum	Temperature of the air: Date	Temperature of the air: Mean maximum	Temperature of the air: Minimum	Temperature of the air: Date	Temperature of the air: Mean minimum	Temperature of the air: Greatest daily range	Mean wet thermometer	Mean temperature of the dew point	Mean relative humidity	Precipitation: Total	Precipitation: Departure from normal	Precipitation: Days with .01, or more	Wind: Total movement	Wind: Prevailing direction	Wind: Maximum velocity: Miles per hour	Wind: Maximum velocity: Direction	Wind: Maximum velocity: Date	Clear days	Partly cloudy days	Cloudy days	Average cloudiness, tenths	Total snowfall	Snow, sleet, and ice on ground at end of month
	Ft.	*Ft.*	*Ft.*	*In.*	*In.*	*In.*	°*F.*	°*F.*	°*F.*		°*F.*	°*F.*		°*F.*	°*F.*	°*F.*	°*F.*	%	*In.*	*In.*		*Miles*								*0–10*	*In.*	*In.*
New England							**55.9**	**+1.3**										**68**	**2.03**	**−1.1**										**5.0**		
Eastport	76	67	85	29.90	29.98	+0.02	48.4	+0.7	79	25	57	32	6	40	37	44	40	76	2.53	−0.5	12	6,916	s.	25	sw.	1	8	5	18	6.6	0.0	0.0
Greenville, Me	1,070	6	----	28.83	30.00	------	51.7	------	90	16	65	27	7	38	39	----	----	----	2.66	------	13	4,505	nw.	21	------	5	7	8	16	----	T.	0.0
Portland, Me	103	82	117	29.88	30.00	+.03	55.8	+2.5	88	16	65	37	11	47	34	48	39	57	0.78	−2.6	7	6,747	n.	21	s.	24	21	5	5	3.5	0.0	0.0
Concord	289	70	79	29.71	30.02	+.04	56.3	+2.0	92	16	70	30	24	43	47	----	----	----	1.72	−1.3	6	4,550	nw.	19	nw.	23	19	8	4	3.3	0.0	0.0
Burlington	403	11	48	29.59	30.02	+.05	55.8	−0.7	88	16	67	33	5	44	42	----	----	----	1.75	−1.1	8	6,994	s.	23	s.	16	9	7	15	6.4	0.0	0.0
Northfield	876	12	60	------	30.03	+.06	52.6	−0.2	90	16	67	27	6	38	48	----	----	64	1.81	−0.9	9	5,837	s.	22	nw.	3	6	17	8	5.7	0.0	0.0
Boston	125	106	165	29.88	30.02	+.04	60.2	+3.1	93	16	70	43	3	51	32	51	44	59	1.63	−1.6	6	6,369	sw.	22	nw.	5	13	12	6	4.5	0.0	0.0
Nantucket	12	14	90	30.02	30.03	+.04	53.0	+0.7	68	15	59	40	11	47	23	49	46	82	2.66	−0.2	8	11,675	sw.	41	ne.	13	13	9	9	5.2	0.0	0.0
Block Island	26	11	46	29.99	30.02	+.03	53.4	+0.6	68	17	59	42	3	48	20	50	48	84	2.15	−1.3	8	11,388	sw.	32	n.	13	11	10	10	5.2	0.0	0.0
Providence	160	215	251	29.85	30.02	+.04	59.6	+1.1	88	26	70	39	11	49	31	51	45	62	2.51	−0.4	12	8,149	nw.	34	nw.	23	16	6	9	4.4	0.0	0.0
Hartford	159	122	----	29.85	30.02	+.04	60.0	+2.5	87	26	71	37	11	49	31	----	----	----	2.13	−1.5	7	------	s.	----	------	----	10	11	10	5.1	0.0	0.0
New Haven	106	74	153	29.92	30.03	+.04	59.4	+1.5	83	26	69	39	11	50	28	51	44	61	2.64	−1.0	9	6,782	s.	24	ne.	13	8	17	6	4.9	0.0	0.0
Middle Atlantic States							**61.9**	**−0.2**										**67**	**3.42**	**0.0**										**5.1**		
Albany	97	107	115	29.92	30.02	+.04	60.6	+1.3	91	26	72	38	3	50	38	51	43	57	1.69	−1.2	6	5,616	s.	22	n.	22	15	13	3	4.0	0.0	0.0
Binghamton	871	10	84	29.13	30.06	+.08	57.4	0.0	90	25	68	33	19	46	42	----	----	----	3.19	−0.1	15	4,637	nw.	27	w.	27	7	4	20	7.0	0.0	0.0
New York	314	414	454	29.70	30.03	+.04	60.9	+0.3	85	26	69	42	3	53	27	53	47	63	1.81	−1.4	9	9,711	sw.	49	nw.	27	9	14	8	5.1	0.0	0.0
Bellefonte	1,050	5	42	28.93	30.04	------	56.7	------	87	26	71	28	23	42	47	51	46	67	3.58	------	12	------	w.	----	------	----	11	9	11	5.3	0.0	0.0
Harrisburg	374	94	104	29.64	30.03	+.05	61.9	+0.1	89	26	72	41	11	52	37	53	46	61	3.87	+0.4	11	5,428	ne.	23	nw.	28	11	11	9	5.0	0.0	0.0
Philadelphia	114	123	367	29.93	30.06	+.07	63.4	+0.5	87	26	72	44	3	54	27	54	47	60	3.81	+0.6	9	9,909	sw.	30	n.	1	7	17	7	5.1	0.0	0.0
Reading	325	81	103	29.69	30.04	------	61.7	−0.8	90	26	72	41	3	52	32	53	46	59	4.94	+1.3	9	5,021	sw.	21	se.	7	12	9	10	5.2	0.0	0.0
Scranton	805	72	103	29.21	30.07	+.09	59.2	−0.2	90	25	70	35	3	48	39	51	45	62	2.73	−0.5	8	5,049	n.	21	nw.	28	7	16	8	5.3	0.0	0.0
Atlantic City	52	37	172	29.99	30.05	+.07	57.8	−0.3	81	17	64	41	3	52	25	53	50	79	4.08	+1.0	10	12,272	s.	44	ne.	12	10	12	9	5.5	0.0	0.0
Cape May	17	13	49	------	------	------	59.4	+0.8	81	28	68	42	20	51	28	54	51	80	3.75	+0.8	9	------	se.	----	------	----	8	13	10	----	0.0	0.0
Sandy Hook	22	10	55	30.01	30.03	------	59.8	------	85	26	67	44	3	53	24	54	49	72	2.79	−0.9	9	9,994	sw.	41	sw.	1	9	13	9	4.9	0.0	0.0
Trenton	190	159	183	29.84	30.04	------	61.0	+0.1	88	27	71	40	3	51	30	53	47	64	3.08	0.0	12	8,019	sw.	30	ne.	13	9	15	7	5.1	0.0	0.0
Baltimore	123	100	215	29.91	30.04	+.05	64.4	0.0	90	26	74	44	3	55	29	56	49	61	5.51	+2.0	11	7,988	sw.	32	nw.	27	12	13	6	4.8	0.0	0.0
Washington	112	62	85	29.92	30.04	+.04	64.2	+0.5	91	7	74	44	3	54	31	55	49	62	5.07	+1.4	10	5,212	nw.	21	nw.	28	14	10	7	4.5	0.0	0.0
Cape Henry	18	8	54	30.02	30.04	------	63.7	−0.5	89	27	71	46	3	57	31	58	55	76	2.06	−1.5	11	9,232	sw.	35	ne.	22	11	8	12	5.7	0.0	0.0
Lynchburg	681	153	188	29.31	30.05	+.05	66.0	−1.3	90	8	77	43	3	55	34	58	53	68	1.38	−2.2	7	5,170	sw.	23	nw.	1	12	15	4	4.7	0.0	0.0
Norfolk	91	170	205	29.96	30.06	+.06	65.2	−1.0	88	7	74	49	3	56	29	58	54	73	2.48	−1.3	11	8,656	s.	30	ne.	22	13	7	11	5.3	0.0	0.0
Richmond	144	11	52	29.90	30.06	+.07	65.1	−1.4	90	7	76	46	30	54	34	59	56	77	4.17	+0.4	13	5,983	sw.	30	w.	1	11	14	6	4.6	0.0	0.0
Wytheville	2,304	49	55	27.70	30.05	+.06	60.6	−0.8	83	5	72	35	3	50	36	54	49	69	4.16	+0.5	11	4,445	w.	21	w.	9	10	11	10	5.5	0.0	0.0
South Atlantic States							**69.7**	**−0.5**										**71**	**3.28**	**−0.2**										**4.7**		
Asheville	2,253	89	104	27.74	30.07	+.08	63.2	+0.6	86	7	74	41	3	52	37	54	49	68	0.84	−2.6	9	5,617	nw.	27	nw.	9	16	10	5	4.2	0.0	0.0
Charlotte	779	55	62	29.23	30.06	+.07	68.5	−0.4	89	8	79	50	3	58	28	59	54	65	3.32	−0.3	8	4,091	ne.	18	nw.	8	14	8	9	4.7	0.0	0.0
Greensboro	886	6	56	29.12	30.07	------	64.4	------	89	8	75	39	3	53	34	58	53	72	2.58	------	----	5,879	sw.	25	nw.	1	12	9	10	4.9	0.0	0.0
Hatteras	11	5	50	30.03	30.04	+.03	67.4	−1.3	82	8	73	48	4	62	24	63	61	81	4.74	+1.0	9	9,031	ne.	34	n.	29	11	11	9	4.9	0.0	0.0
Raleigh	376	103	146	29.66	30.05	+.06	67.3	−1.2	92	8	77	48	3	57	31	59	53	67	6.35	+2.5	12	6,259	sw.	30	w.	8	11	10	10	5.2	0.0	0.0
Wilmington	72	73	106	29.98	30.05	+.04	68.8	−2.0	91	8	77	51	3	60	28	63	60	79	5.14	+1.7	12	6,438	s.	32	s.	1	11	8	12	5.2	0.0	0.0
Charleston	48	11	92	29.99	30.04	+.03	72.6	−0.1	91	8	79	58	3	66	24	66	63	77	5.64	+2.6	8	8,130	s.	37	ne.	20	10	12	9	4.9	0.0	0.0
Columbia, S. C	351	41	57	29.67	30.04	+.04	70.6	−1.3	89	8	81	53	13	60	30	61	56	66	2.42	−0.7	12	5,566	ne.	21	ne.	19	12	13	6	4.4	0.0	0.0
Due West	711	10	55	29.31	30.08	------	68.4	------	87	28	79	50	13	58	30	----	----	----	1.99	------	10	6,332	ne.	23	ne.	18	11	12	8	4.9	0.0	0.0
Greenville, S. C	1,039	139	146	28.97	30.05	------	68.0	+0.8	88	8	77	48	19	58	29	59	53	66	2.02	−2.0	12	6,408	s.	25	ne.	18	13	11	7	4.7	0.0	0.0
Augusta	182	62	77	29.83	30.02	+.03	72.2	−0.2	92	8	83	54	4	61	32	62	56	63	2.02	−1.0	9	4,819	ne.	21	se.	26	14	11	6	4.4	0.0	0.0
Savannah	65	150	194	29.96	30.03	+.03	73.0	−0.4	92	8	81	56	13	65	30	66	63	76	1.39	−1.6	8	8,569	e.	47	nw.	9	13	7	11	5.1	0.0	0.0
Jacksonville	43	209	245	29.96	30.01	+.01	74.9	−0.1	91	9	82	61	13	67	23	66	63	74	2.25	−1.8	6	8,307	e.	32	w.	28	13	12	6	4.4	0.0	0.0
Florida Peninsula							**77.2**	**−0.1**										**74**	**8.85**	**+4.6**										**5.6**		
Key West	22	10	64	29.95	29.97	.00	78.6	−0.5	88	29	84	67	30	73	19	72	69	73	5.96	+2.4	11	6,723	e.	24	w	20	14	10	7	4.8	0.0	0.0
Miami	25	124	168	29.97	30.00	+.01	76.0	−0.4	90	10	83	63	14	70	26	70	67	76	15.40	+9.2	16	7,765	ne.	30	s.	25	5	8	18	6.9	0.0	0.0
Tampa	35	88	197	29.96	30.00	+.01	76.9	+0.6	92	24	87	62	5	67	25	68	65	74	5.20	+2.2	11	8,257	e.	40	nw.	29	12	15	4	4.8	0.0	0.0
Titusville	44	5	----	29.95	30.00	------	76.6	------	94	9	86	60	13	68	29	----	----	----	5.90	------	11	------	se.	----	------	----	5	19	7	5.8	0.0	0.0
East Gulf States							**71.2**	**−1.3**										**70**	**5.32**	**+1.5**										**5.0**		
Atlanta	1,173	190	198	28.82	30.05	+.06	67.6	−2.3	85	7	76	51	2	59	26	59	53	64	1.80	−1.7	9	7,542	e.	29	e.	19	11	10	10	5.3	0.0	0.0
Macon	370	76	84	29.64	30.03	+.04	71.0	−1.3	92	9	82	49	3	60	33	62	56	63	2.21	−0.8	7	5,284	nw.	20	w.	26	10	8	13	5.5	0.0	0.0
Thomasville	273	49	103	29.72	30.01	+.02	73.8	−0.2	91	8	84	55	3	63	29	64	59	67	6.95	+3.3	11	5,942	se.	19	e.	19	12	10	9	4.7	0.0	0.0
Apalachicola	36	11	51	29.96	30.00	------	74.0	------	90	29	81	58	3	67	22	68	65	74	2.34	−1.1	5	7,111	se.	30	e.	19	19	9	3	3.1	0.0	0.0
Pensacola	56	149	185	29.94	30.00	+.01	72.4	−1.5	85	29	78	59	3	67	18	67	64	79	8.50	+5.1	7	9,366	s.	40	se.	19	16	6	9	4.5	0.0	0.0
Anniston	741	9	57	------	------	------	68.3	−0.1	88	7	80	43	3	57	37	----	----	----	1.19	------	7	3,515	s.	17	s	20	6	15	10	----	0.0	0.0
Birmingham	700	11	48	29.28	30.04	+.06	69.9	−1.2	86	15	80	49	3	60	31	60	55	67	2.38	−1.6	7	5,109	n.	23	se.	25	11	11	9	4.8	0.0	0.0
Mobile	57	125	161	29.93	29.99	.00	72.7	−1.7	88	28	80	55	3	65	26	66	62	77	10.59	+6.3	10	7,553	s.	40	se.	20	12	8	11	5.2	0.0	0.0
Montgomery	223	100	112	29.78	30.03	+.04	71.8	−1.6	87	28	81	54	3	62	27	63	57	66	3.16	−0.7	9	5,372	e.	27	ne.	19	14	7	10	4.8	0.0	0.0
Corinth	469	6	----	------	------	------	70.2	------	92	31	82	45	3	58	39	----	----	----	1.34	------	5	------	se.	----	------	----	9	22	0	----	0.0	0.0
Meridian	375	87	95	29.62	30.01	+.03	69.7	−1.6	88	31	80	46	3	60	32	62	58	72	4.14	−0.2	11	4,551	ne.	19	e.	20	11	10	10	5.4	0.0	0.0
Vicksburg	247	65	73	29.75	30.02	+.05	71.6	−1.3	88	31	80	57	2	63	24	62	58	68	1.40	−2.9	10	5,388	ne.	17	e.	21	8	7	16	6.2	0.0	0.0
New Orleans	53	76	84	29.93	29.98	+.01	74.1	−1.3	88	28	81	61	4	67	20	66	62	73	15.06	+10.5	9	5,639	se.	28	ne.	18	10	11	10	5.5	0.0	0.0
West Gulf States							**73.5**	**+0.1**										**70**	**2.32**	**−1.7**										**4.7**		
Shreveport	249	204	220	29.73	30.00	+.05	73.4	−0.2	90	31	83	56	19	64	27	64	59	69	1.34	−2.9	6	7,083	s.	26	s.	5	11	15	5	4.7	0.0	0.0
Bentonville	1,303	11	44	28.64	30.00	+.07	66.4	0.0	85	23	79	42	17	54	37	----	----	----	0.90	------	4	4,866	s.	19	s.	31	27	3	1	----	----	----
Fort Smith	457	79	94	29.52	30.00	+.07	70.6	+1.0	88	26	81	51	2	60	31	61	54	61	2.62	−2.2	8	5,527	e.	30	sw.	7	10	16	5	4.8	0.0	0.0
Little Rock	357	136	153	29.64	30.01	+.06	70.6	+0.3	87	31	80	54	2	62	26	61	54	62	3.23	−1.6	8	6,721	s.	38	nw.	8	7	9	15	6.3	0.0	0.0
Austin	605	136	148	29.32	29.95	------	74.7	+0.1	92	23	85	56	20	65	31	66	61	69	1.11	−3.5	6	6,235	se.	27	se.	15	11	8	12	5.0	0.0	0.0
Brownsville	57	83	100	29.87	29.93	------	77.2	−1.4	91	20	85	61	16	70	29	70	68	80	0.56	−1.7	4	7,992	se.	36	nw.	16	14	13	4	4.4	0.0	0.0
Corpus Christi	20	11	78	29.93	29.95	+.05	77.0	+0.8	89	20	83	63	16	71	25	70	68	79	1.65	−1.6	3	8,839	se.	34	e.	11	11	12	8	4.7	0.0	0.0
Dallas	512	220	227	29.45	29.99	------	71.8	------	93	26	80	57	17	63	29	----	----	----	4.76	+0.3	8	8,119	se.	38	w.	28	13	9	9	4.2	0.0	0.0
Fort Worth	670	106	114	29.26	29.96	+.05	72.2	−0.1	93	26	82	56	13	63	29	64	60	70	6.03	+1.4	9	5,958	s.	24	e.	7	13	5	13	5.2	0.0	0.0
Galveston	54	106	114	29.89	29.95	+.01	75.8	+1.0	86	23	81	61	15	71	19	69	66	77	1.56	−1.9	3	7,045	se.	27	nw.	15	12	17	2	4.1	0.0	0.0
Houston	138	292	314	29.83	29.98	------	75.5	0.0	89	27	84	62	19	68	20	----	----	----	0.56	−3.9	3	8,940	se.	34	se.	15	8	16	7	5.2	0.0	0.0
Palestine	510	64	72	29.47	29.99	+.06	73.1	+0.4	90	31	82	58	19	64	27	65	60	69	2.61	−1.9	5	5,774	s.	22	s.	6	13	11	7	4.3	0.0	0.0
Port Arthur	34	58	66	29.93	29.97	------	75.9	------	88	29	83	61	19	69	22	----	----	----	2.04	------	6	5,906	s.	23	e.	16	15	16	0	4.1	0.0	0.0
San Antonio	693	242	301	29.22	29.92	+.02	75.4	+0.3	92	27	85	58	17	66	29	66	62	68	2.10	−1.1	6	9,188	se.	56	se.	9	14	12	5	4.0	0.0	0.0
Taylor	571	38	51	29.40	30.00	+.09	73.6	−0.7	92	26	84	56	20	63	28	----	----	----	2.03	−2.0	6	6,446	se.	27	nw.	15	14	9	8	4.6	0.0	0.0

TABLE 1.—*Climatological data for Weather Bureau stations, May, 1932*—Continued

District and station	Elevation of instruments: Barometer above sea level	Elevation of instruments: Thermometer above ground	Elevation of instruments: Anemometer above ground	Pressure: Station, reduced to mean of 24 hours	Pressure: Sea level, reduced to mean of 24 hours.	Pressure: Departure from normal	Temperature of the air: Mean max.+ mean min.÷	Temperature of the air: Departure from normal	Temperature of the air: Maximum	Temperature of the air: Date	Temperature of the air: Mean maximum	Temperature of the air: Minimum	Temperature of the air: Date	Temperature of the air: Mean minimum	Temperature of the air: Greatest daily range	Mean wet thermometer	Mean temperature of the dew-point	Mean relative humidity	Precipitation: Total	Precipitation: Departure from normal	Precipitation: Days with 0.01, or more	Wind: Total movement	Wind: Prevailing direction	Wind: Maximum velocity: Miles per hour	Wind: Maximum velocity: Direction	Wind: Maximum velocity: Date	Clear days	Partly cloudy days	Cloudy days	Average cloudiness, tenths	Total snowfall	Snow, sleet, and ice on ground at end of month
Ohio Valley and Tennessee	*Ft.*	*Ft.*	*Ft.*	*In.*	*In.*	*In.*	*° F.*	*° F.*	*°F.*		*°F.*	*° F.*		*°F.*	*° F.*	*° F.*	*° F.*	*X*	*In.*	*In.*		*Miles*								*0–10*	*In.*	*In.*
							64.9	**0.0**										**61**	**1.50**	**−2.2**										**4.8**		
Chattanooga	762	190	215	29.26	30.06	+0.07	67.8	−1.0	85	7	78	48	3	58	31	59	53	64	2.59	−1.2	9	5,325	ne.	28	nw.	11	8	17	6	5.2	0.0	0.0
Knoxville	995	102	111	29.00	30.05	+.06	67.6	+0.4	87	15	78	45	3	57	34	58	52	64	1.59	−2.2	8	5,039	sw.	27	sw.	26	14	10	7	4.3	0.0	0.0
Memphis	399	78	86	29.61	30.03	+.07	70.7	+0.1	89	31	80	52	2	62	24	61	55	62	0.58	−3.6	9	5,445	e.	21	n.	26	8	16	7	5.1	0.0	0.0
Nashville	546	168	191	29.49	30.08	+.10	67.5	−0.7	84	31	77	47	3	58	31	58	52	60	1.32	−2.6	8	6,943	s.	38	nw.	11	10	15	6	4.8	0.0	0.0
Lexington	989	193	230	29.02	30.08	+.09	64.0	−0.3	84	15	73	41	2	54	31				0.60	−3.2	7	9,044	sw.	30	nw.	9	22	5	4	3.1	0.0	0.0
Louisville	525	188	234	29.49	30.07	+.09	65.8	−0.8	86	26	75	45	2	56	32	56	50	60	0.63	−3.1	6	7,602	s.	36	nw.	9	6	17	8	5.5	0.0	0.0
Evansville	431	76	116	29.59	30.05	+.08	66.8	+0.1	85	15	77	44	2	57	33	58	52	63	0.99	−2.9	4	6,939	s.	30	nw.	26	13	11	7	4.5	0.0	0.0
Indianapolis	822	194	230	29.16	30.04	+.07	63.3	+0.4	85	15	73	41	23	53	39	54	47	59	0.60	−3.3	7	7,710	sw.	29	nw.	9	15	10	6	4.5	0.0	0.0
Terre Haute	575	96	129	29.43	30.04		64.0		87	24	74	40	2	54	36	55	48	60	1.96	−1.9	9	7,012	s.	27	w.	9	15	9	7	4.3	0.0	0.0
Cincinnati	627	11	51	29.39	30.06	+.07	64.2	+1.1	87	24	75	38	2	53	38	55	48	60	0.94	−2.8	7	5,449	sw.	21	w.	16	13	10	8	4.9	0.0	0.0
Columbus	822	216	230	29.18	30.05	+.07	63.3	+1.0	85	26	74	40	3	52	34	53	46	58	0.79	−2.8	8	7,735	sw.	32	sw.	16	11	14	6	4.6	0.0	0.0
Dayton	899	137	173	29.10	30.05		63.1	+0.5	86	21	74	38	2	52	38	54	47	59	2.47	−1.1	10	6,503	sw.	32	sw.	26	11	17	3	4.6	0.0	0.0
Elkins	1,947	59	67	28.04	30.08	+.08	58.4	−0.8	84	26	71	29	3	46	42	52	46	67	3.52	−0.5	12	3,878	nw.	21	nw.	27	10	8	13	5.9	0.0	0.0
Parkersburg	637	77	82	29.42	30.08	+.09	64.0	+0.2	88	7	76	36	3	52	42	54	47	58	1.22	−2.2	10	4,362	se.	27	nw.	16	12	10	9	5.2	0.0	0.0
Pittsburgh	842	353	410	29.15	30.06	+.07	61.6	−0.8	86	25	72	35	3	51	35	53	46	60	3.03	−0.2	10	6,921	sw.	30	nw.	16	9	10	12	5.4	0.0	0.0
Lower Lake Region							**57.8**	**+0.3**										**66**	**2.71**	**−0.5**										**5.4**		
Buffalo	767	243	280	29.21	30.04	+.07	53.2	−1.4	77	16	60	36	2	46	27	48	44	74	3.45	+0.4	11	9,863	sw.	40	sw.	16	10	9	12	5.8	0.0	0.0
Canton	448	10	61	29.53	30.00		55.6	−0.6	86	16	67	30	5	45	34				1.57	−1.4	8	6,662	sw.	27	w.	24	8	11	12	6.0	0.0	0.0
Ithaca	836	74	100	29.14	30.04		57.5	0.0	88	25	68	31	19	47	42	50	43	62	3.46	+0.1	15	6,679	nw.	27	se.	10	8	11	12	5.9	0.0	0.0
Oswego	335	71	85	29.67	30.04	+.07	55.0	−0.2	87	16	63	37	3	47	30	48	42	64	1.68	−1.4	11	6,506	w.	22	n.	22	7	9	15	6.5	0.0	0.0
Rochester	523	86	102	29.48	30.05	+.08	57.2	+0.1	87	16	66	36	3	48	31	50	43	61	2.22	−0.7	12	6,813	w.	26	w.	25	11	10	10	5.9	0.0	0.0
Syracuse	596	65	79	29.42	30.06	+.08	58.6	+1.3	88	16	68	36	3	49	34				1.57	−1.4	13	5,419	s.	21	s.	17	9	9	13	6.0	0.0	0.0
Erie	714	130	166	29.28	30.05	+.07	56.4	−0.4	86	16	66	35	3	47	35	51	45	68	3.49	+0.1	9	8,676	w.	35	w.	16	12	5	14	5.1	0.0	0.0
Cleveland	762	267	337	29.22	30.05	+.07	58.7	+0.8	84	15	67	38	2	50	31	52	45	63	3.71	+0.6	14	9,017	sw.	40	s.	16	10	9	12	5.4	0.0	0.0
Sandusky	629	5	67	29.37	30.05	+.07	60.1	+0.9	88	25	70	37	3	50	38				2.73	−0.4	13	6,543	sw.	31	w.	16	11	13	7	5.0	0.0	0.0
Toledo	628	208	243	29.36	30.05	+.08	60.6	+1.2	88	15	70	37	2	51	33	53	46	64	2.01	−1.5	11	8,758	sw.	44	sw.	16	12	13	6	4.4	0.0	0.0
Fort Wayne	856	100	119	29.12	30.04		60.6	+0.4	86	15	71	36	2	50	35	53	47	64	1.21	−2.6	10	6,997	sw.	25	sw.	25	13	10	8	4.8	0.0	0.0
Detroit	730	218	258	29.26	30.05	+.08	59.6	+1.6	88	15	70	36	2	50	32	53	48	70	5.42	+2.2	12	6,848	sw.	31	sw.	16	10	14	7	4.6	0.0	0.0
Upper Lake Region							**54.2**	**+1.4**										**70**	**3.39**	**+0.2**										**6.1**		
Alpena	609	13	89	29.37	30.04	+.07	51.4	+0.9	90	15	60	30	2	42	41	46	42	73	4.07	+1.0	15	8,348	se.	40	sw.	16	10	11	10	5.6	0.0	0.0
Escanaba	612	54	60	29.36	30.03	+.06	49.3	−0.3	75	15	56	32	2	42	25	45	41	74	2.60	−0.3	10	7,981	s.	26	ne.	21	7	11	13	6.5	T.	0.0
Grand Haven	632	54	89	29.34	30.02	+.06	54.6	+0.1	80	15	64	32	2	45	30	49	43	68	3.17	0.0	13	7,620	sw.	27	w.	27	9	7	15	6.3	0.0	0.0
Grand Rapids	707	70	244	29.25	30.02	+.05	59.4	+1.4	88	15	70	34	2	49	33	51	44	61	4.95	+1.5	11	8,105	sw.	34	sw.	16	8	8	15	6.5	0.0	0.0
Houghton	668	64	99	29.27	30.00	+.03	51.6	+2.1	90	14	62	31	4	41	44				3.97	+0.9	15	7,646	e.	27	w.	15	7	10	14	6.2	1.0	0.0
Lansing	878	6	88	29.08	30.03		57.4	+0.5	86	15	68	31	2	46	36	53	49	75	5.03	+1.6	12	6,181	s.	30	sw.	6	9	12	10	5.3	0.0	0.0
Ludington	637	60	66	29.32	30.02		52.4	+0.2	73	14	60	32	2	45	27	48	43	74	2.13	−0.9	16	7,696	s.	26	s.	16	13	8	10	5.1	0.0	0.0
Marquette	734	77	111	29.20	30.02	+.05	51.0	+2.0	91	15	60	30	2	42	41	45	40	70	3.42	+0.5	14	6,989	nw.	32	sw.	15	3	9	19	7.6	0.4	0.0
Port Huron	638	70	120	29.34	30.03	+.06	56.2	+1.0	84	25	66	32	2	46	33	50	45	72	5.24	+2.3	15	7,407	s.	27	w.	16	8	11	12	5.9	0.0	0.0
Sault Sainte Marie	614	11	52	29.34	30.04	+.09	50.8	+1.8	83	15	61	28	2	40	37	45	39	66	2.08	−0.4	13	5,875	se.	26	sw.	19	10	7	14	5.8	T.	0.0
Chicago	673	7	131	29.30	30.03	+.07	59.6	+2.1	89	15	68	41	2	52	33	52	46	68	2.89	−0.6	11	8,009	sw.	30	nw.	25	11	9	11	5.3	0.0	0.0
Green Bay	617	109	141	29.34	30.00	+.05	55.9	+1.0	86	14	65	35	2	46	32	49	44	69	2.79	−0.7	8	8,485	s.	31	w.	16	4	12	15	6.9	0.0	0.0
Milwaukee	681	97	221	29.28	30.02	+.06	56.8	+2.7	88	15	65	38	2	49	36	49	43	66	1.53	−1.8	11	9,465	n.	34	n.	21	8	13	10	5.7	0.0	0.0
Duluth	1,133	5	47	28.76	29.98	+.02	51.7	+4.4	91	14	62	32	1	41	44	45	39	69	3.00	−0.2	12	9,938	ne.	39	nw.	15	8	8	15	6.3	2.0	0.0
North Dakota							**56.2**	**+2.2**										**62**	**2.42**	**0.0**										**5.6**		
Moorhead	940	50	58	28.94	29.95	+.01	57.0	+1.9	93	14	69	31	1	45	41	49	41	62	2.05	−0.8	10	6,963	s.	24	s.	23	5	12	14	6.7	0.0	0.0
Bismarck	1,674	8	57	28.18	29.95	+.03	56.6	+2.0	91	13	68	32	1	45	39	49	44	68	3.78	+1.5	8	7,305	e.	35	se.	22	12	8	11	5.5	4.0	0.0
Devils Lake	1,478	11	44	28.40	29.97	+.03	54.5	+1.9	90	13	66	30	26	43	36	47	40	61	2.24	+0.2	8	7,931	ne.	32	ne.	19	10	11	10	5.9	6.0	0.0
Ellendale	1,457	10	56	28.40	29.96		55.8		90	13	68	32	26	44	45				2.49	−0.6	12	10,327	ne.	41	sw.	24	7	12	12	5.9	1.3	0.0
Grand Forks	833	12	67				56.4		92	13	70	26	1	43	45	49			2.30		7		ne.	27	sw.	23	7	14	10		0.0	0.0
Williston	1,878	41	48	27.97	29.94	+.01	57.0	+3.0	90	13	69	31	16	45	43	48	39	56	1.52	−0.5	6	6,777	se.	28	w.	22	17	9	5	4.0	0.0	0.0
Upper Mississippi Valley							**63.3**	**+1.8**										**61**	**2.75**	**−1.2**										**5.1**		
Minneapolis	918	102	208	28.97	29.94		59.1	+1.4	95	14	69	37	1	50	34				2.05	−1.6	14	8,321	s.	25	nw.	16	10	4	17	6.4	0.0	0.0
St. Paul	837	114	149	29.06	29.96	+.02	59.0	+1.1	96	14	69	38	1	49	35				2.11	−1.2	16	6,964	sw.	27	sw.	18	11	6	14	5.9	0.0	0.0
La Crosse	714	11	48	29.21	29.98	+.04	60.5	+1.2	93	14	72	36	2	49	37	53	48	68	3.82	+0.1	11	4,359	s.	18	sw.	15	10	7	14	6.1	0.0	0.0
Madison	974	70	78	28.96	30.00	+.04	58.6	+1.0	87	14	69	39	22	49	32	51	45	64	3.67	−0.2	14	6,539	s.	27	n.	11	7	10	14	6.1	0.0	0.0
Wausau	1,247	4	62	28.67	30.00		55.3		88	14	66	32	28	44	36				2.63	−1.0	13	4,843	s.	25	w.	16	10	8	13	6.3	0.0	0.0
Charles City	1,015	10	51	28.92	29.99	+.05	60.4	+2.6	93	14	72	35	2	49	37	53	48	66	4.92	+0.6	13	5,768	se.	21	w.	27	15	7	9	4.4	0.0	0.0
Davenport	606	118	143	29.36	30.01	+.06	64.0	+2.7	90	14	75	41	28	53	34	54	47	59	3.18	−0.8	11	7,534	sw.	32	sw.	6	11	11	9	4.9	0.0	0.0
Des Moines	861	5	99	29.08	29.98	+.05	63.8	+2.5	91	14	76	38	2	52	35	55	48	60	2.68	−1.9	11	7,593	s.	32	w.	25	11	8	12	5.1	0.0	0.0
Dubuque	700	81	96	29.25	30.00	+.05	62.1	+1.8	92	14	73	37	2	52	33	54	47	63	3.02	−1.2	10	5,269	s.	21	n.	11	13	7	11	5.4	0.0	0.0
Keokuk	614	64	78	29.36	30.02	+.08	65.3	+1.5	90	14	76	41	2	54	32	55	47	54	2.50	−1.4	8	5,626	sw.	24	s.	15	15	8	8	4.2	0.0	0.0
Cairo	358	87	93	29.66	30.03	+.07	68.4	0.0	87	31	78	48	2	59	27	59	54	64	0.50	−3.2	3	6,526	s.	25	n.	11	7	13	11	5.7	0.0	0.0
Peoria	609	11	45	29.38	30.04	+.08	63.7	+2.0	91	14	76	35	2	52	36	55	48	63	3.61	−0.4	10	5,052	sw.	22	w.	8	16	8	7	3.9	0.0	0.0
Springfield, Ill	636	5	191	29.35	30.02	+.07	66.4	+3.2	91	14	77	44	2	56	36	56	49	58	2.78	−1.6	8	8,546	s.	38	nw	8	15	11	5	4.1	0.0	0.0
Hannibal	534	74	109	29.46	30.03	+.09	66.4	+2.8	90	14	77	38	2	56	37				1.68	−2.7	8	6,514	sw.	24	nw.	8	18	5	8	3.9	0.0	0.0
St. Louis	568	265	303	29.42	30.02	+.07	68.0	+1.1	89	14	78	48	2	58	33	56	48	54	2.09	−2.2	8	8,996	sw.	32	sw.	15	18	8	5	3.4	0.0	0.0
Missouri Valley							**64.1**	**+2.6**										**61**	**3.00**	**−0.9**										**4.6**		
Columbia, Mo	784	6	84	29.20	30.03	+.09	66.3	+2.0	90	24	78	40	2	55	34				1.67	−2.8	7	5,913	sw.	24	sw.	3	15	9	7	4.2	0.0	0.0
Kansas City	963	10	86	28.99	30.01	+.09	67.0	+2.2	89	14	76	45	16	58	31	57	50	58	2.63	−2.0	12	6,730	se.	31	nw.	8	16	9	6	4.1	0.0	0.0
St. Joseph	967	11	49	28.96	29.99		66.0		90	14	77	43	28	55	34	56	49	59	3.21	−1.0	9	6,509	se.	36	nw.	8	15	11	5	3.8	0.0	0.0
Springfield, Mo	1,324	18	104	28.53	30.02	+.09	65.5	+1.0	84	23	75	46	28	56	27	56	49	58	3.18	−2.0	7	7,424	s.	26	se.	31	21	8	2	2.7	0.0	0.0
Iola	984	11	50	28.97	30.00	+.08	66.2	+1.0	88	23	78	43	17	54	36				1.64	−3.1	8	4,935	s.	18	s.	3	15	12	4	4.0	0.0	0.0
Topeka	987	92	107				66.0	+1.7	90	14	77	43	16	55	33				2.59	−1.9	10	6,646	s.	27	nw.	15	17	9	5	3.6	0.0	0.0
Lincoln	1,189	11	81	28.71	29.96	+.05	64.8	+3.1	93	14	76	38	1	53	37	56	49	61	2.82	−1.3	9	7,622	s.	36	nw.	25	9	13	9	5.3	0.0	0.0
Omaha	1,105	115	122	28.80	29.97	+.05	64.8	+2.4	92	14	75	40	27	54	31	55	47	58	4.29	+0.5	10	6,052	s.	30	n.	15	12	9	10	5.1	0.0	0.0
Valentine	2,598	47	54	27.26	29.93	+.05	60.2	+4.0	92	13	73	31	1	48	39	51	44	63	2.66	−0.2	10	7,744	n.	42	sw.	5	7	16	8	5.3	0.0	0.0
Sioux City	1,135	94	164	28.74	29.94	+.02	63.4	+3.0	92	14	74	39	27	52	35	54	48	61	2.71	−1.3	10	9,183	s.	33	s.	2	9	9	13	5.7	0.0	0.0
Huron	1,306	59	74	28.56	29.95	+.03	60.4	+4.0	93	19	72	36	1	48	36	52	46	65	2.67	−0.3	14	7,788	se.	27	ne.	15	13	13	5	4.0	0.0	0.0
Pierre	1,572	70	75	28.27	29.92	+.01	61.6	+3.6	94	13	74	36	27	50	37	53	47	65	4.84	+2.4	13	7,710	nw.	31	ne.	20	10	12	9	5.5	0.0	0.0
Yankton	1,233	49	57	28.65	29.96	+0.4	63.1	+3.7	9[illegible]	14	[illegible]4	37	27	52	32				4.07	+0.2	9	6,915	nw.	24	s.	2	8	11	12	5.9	0.0	0.0

TABLE 1.—*Climatological data for Weather Bureau stations, May, 1932*—Continued

District and station	Elevation of instruments: Barometer above sea level	Elevation of instruments: Thermometer above ground	Elevation of instruments: Anemometer above ground	Pressure: Station, reduced to mean of 24 hours	Pressure: Sea level, reduced to mean of 24 hours.	Pressure: Departure from normal	Temperature of the air: Mean max.+ mean min.÷	Temperature of the air: Departure from normal	Temperature of the air: Maximum	Temperature of the air: Date	Temperature of the air: Mean maximum	Temperature of the air: Minimum	Temperature of the air: Date	Temperature of the air: Mean minimum	Temperature of the air: Greatest daily range	Mean wet thermometer	Mean temperature of the dew-point	Mean relative humidity	Precipitation: Total	Precipitation: Departure from normal	Precipitation: Days with 0.01, or more	Wind: Total movement	Wind: Prevailing direction	Wind: Maximum velocity: Miles per hour	Wind: Maximum velocity: Direction	Wind: Maximum velocity: Date	Clear days	Partly cloudy days	Cloudy days	Average cloudiness, tenths	Total snowfall	Snow, sleet, and ice on ground at end of month
Northern Slope	*Ft.*	*Ft.*	*Ft.*	*In.*	*In.*	*In.*	*° F.*	*° F.*	*°F.*		*°F.*	*° F.*		*°F.*	*° F.*	*° F.*	*° F.*	X	*In.*	*In.*		*Miles*								*0–10*	*In.*	*In.*
							55.1	**+2.4**										**60**	**2.00**	**−0.4**										**5.8**		
Billings	3,140	5					55.9		88	13	70	28	1	42	47				1.90		11		nw.				8	14	9		T.	0.0
Havre	2,505	11	67	27.30	29.92	+0.02	57.2	+3.8	87	13	70	30	1	44	43	47	37	55	2.08	0.0	8	7,378	sw.	31	e.	21	9	17	5	4.9	0.0	0.0
Helena	4,124	89	113	25.76	29.92	−.01	53.7	+2.1	84	12	65	34	1	43	37	44	36	56	1.16	−1.1	16	6,421	sw.	38	sw.	18	2	15	14	6.9	0.3	0.0
Kalispell	2,973	48	56	26.91	29.95	+.07	52.6	+1.2	81	12	64	30	25	42	39	45	38	66	1.96	+0.5	14	4,957	nw.	23	sw.	21	5	14	12	6.1	T.	0.0
Miles City	2,371	48	55	27.43	29.96	+.05	59.3	+2.6	91	13	71	34	1	48	36	49	41	57	0.72	−1.5	9	5,061	ne.	32	sw.	30	9	16	6	5.0	0.0	0.0
Rapid City	3,259	50	58	26.57	29.96	+.06	57.4	+3.4	86	13	68	33	1	47	34	49	43	63	5.02	+1.5	15	6,589	n.	30	n.	15	7	13	11	6.0	0.0	0.0
Cheyenne	6,088	84	101	24.00	29.91	+.06	52.2	+1.9	81	22	64	28	16	40	37	42	34	59	1.47	−1.0	13	8,541	s.	39	w.	30	3	14	14	6.6	0.1	0.0
Lander	5,372	60	68	24.62	29.92	+.04	53.2	+2.0	83	21	66	29	16	40	43	43	33	54	1.40	−0.9	8	4,457	sw.	40	sw.	18	12	13	6	4.9	2.1	0.0
Sheridan	3,790	10	47	26.07	29.94		55.2		86	13	68	30	27	42	41	47	41	65	3.35	+0.7	11	4,547	nw.	27	se.	21	9	16	6	5.0	0.0	0.0
Yellowstone Park	6,241	11	48	23.87	29.95	+.04	47.2	−0.2	76	21	59	26	27	35	34	39	32	63	1.69	−0.6	16	6,028	sw.	29	sw.	1	4	12	15	6.9	6.4	0.0
North Platte	2,821	11	51	27.03	29.92	+.04	63.2	+4.5	91	19	77	32	1	50	38	53	47	64	1.11	−1.7	8	6,613	se.	28	w.	25	9	14	8	5.3	0.0	0.0
Middle Slope							**65.0**	**+2.5**										**56**	**2.11**	**−1.3**										**4.6**		
Denver	5,292	106	113	24.70	29.89	+.05	59.5	+3.3	86	22	72	36	7	48	33	46	34	47	1.55	−0.7	10	6,078	s.	30	n.	25	11	10	10	5.2	0.0	0.0
Pueblo	4,685	80	86	25.26	29.88	+.05	62.6	+3.4	90	18	77	40	7	48	44	47	33	44	0.32	−1.3	3	5,664	se.	31	w.	30	10	16	5	4.8	0.0	0.0
Concordia	1,392	50	58	28.53	29.99	+.08	65.3	+2.1	89	14	77	39	16	54	35	56	49	61	2.21	−2.0	12	6,498	s.	29	s.	2	13	15	3	4.3	0.0	0.0
Dodge City	2,509	10	86	27.39	29.96	+.09	66.0	+2.5	90	14	78	40	16	54	33	54	47	59	1.20	−1.7	7	9,807	s.	44	s.	14	17	11	3	3.2	0.0	0.0
Wichita	1,358	85	93	28.56	29.97	+.07	67.0	+1.9	89	31	78	44	1	56	29	57	49	57	1.90	−2.6	10	8,337	s.	34	s.	5	13	10	8	4.6	0.0	0.0
Oklahoma City	1,214	10	47	28.71	29.97	+.08	69.4	+1.7	89	23	80	47	17	59	29	60	55	67	5.50	+0.6	8	6,984	s.	24	s.	3	11	8	12	5.4	0.0	0.0
Southern Slope							**70.4**	**−0.2**										**60**	**4.64**	**+2.9**										**4.5**		
Abilene	1,738	10	52	28.17	29.95	+.08	71.0	−1.0	90	23	82	47	17	60	29	62	57	69	10.99	+7.0	10	6,926	s.	38	se.	29	14	8	9	4.8	0.0	0.0
Amarillo	3,676	10	49	26.26	29.93	+.09	67.3	+3.2	90	25	80	45	16	55	36	54	45	55	1.02	−1.8	3	6,377	se.	37	sw.	14	13	14	4	4.0	0.0	0.0
Big Spring	2,537	5	62				69.0		88	31	80	49	17	58	30				5.27		13		s.				13	10	8	4.5	0.0	0.0
Del Rio	944	64	71	28.89	29.86	+.01	76.2	−0.8	93	26	86	53	17	66	31	66	61	66	4.69	+1.8	9	8,274	se.	44	n.	6	10	10	11	5.3	0.0	0.0
Roswell	3,566	75	85	26.33	29.88	+.06	67.0	−2.4	91	27	81	40	7	53	38	53	41	50	1.87	+0.8	6	6,281	se.	30	se.	27	16	12	3	3.8	0.0	0.0
Southern Plateau							**66.2**	**+0.9**										**37**	**0.58**	**+0.2**										**2.2**		
El Paso	3,778	152	175	26.12	29.81	+.03	73.2	+1.7	94	19	86	47	7	60	36	53	33	30	1.46	+1.1	1	7,638	e.	41	ne.	10	22	7	2	2.1	0.0	0.0
Albuquerque	4,972	51	66	25.02	29.82		63.4		87	22	78	35	7	49	37	47	32	41	1.41		4	4,998	sw.	29	se.	28	18	9	4	3.4	0.0	0.0
Santa Fe	7,013	38	53	23.26	29.85	+.04	55.6	−0.1	77	18	68	30	7	43	33	43	30	44	1.27	0.0	7	5,019	se.	24	se.	21	15	12	4	3.9	0.0	0.0
Flagstaff	6,907	10	59	23.32	29.82	+.04	49.5	−1.2	76	17	65	26	5	34	41	39		51	0.69		4	7,291	sw.	31	sw.	3	12	17	2		T.	0.0
Phoenix	1,108	10	107	28.65	29.79	+.01	77.3	+2.3	104	17	93	51	6	62	39	54	32	23	0.00	−0.1	0	5,128	w.	24	sw.	3	27	3	1	1.3	0.0	0.0
Yuma	141	9	54	29.66	29.81	+.02	77.0	+0.8	103	17	93	50	7	61	42	58	42	35	0.00	0.0	0	4,819	w.	19	w.	1	30	1	0	0.5	0.0	0.0
Independence	3,957	6	27	25.89	29.87	+.03	64.8	+1.8	91	20	80	39	4	49	41	46			0.18	0.0	4		nw.	21	nw.	18	17	8	6		0.0	0.0
Middle Plateau							**57.6**	**+1.7**										**46**	**0.77**	**−0.2**										**4.3**		
Reno	4,532	74	81	25.42	29.90	−.01	55.4	+1.8	84	17	68	35	23	43	40	43	33	48	0.24	−0.4	6	6,326	w.	32	s.	20	16	7	8	4.2	0.0	0.0
Tonopah	6,090	12	20				54.2		78	17	64	30	4	44	27	42	31	48	1.00		9		nw.									
Winnemucca	4,344	18	56	25.58	29.94	+.03	54.8	+0.9	86	17	68	33	23	41	43	44	35	58	1.65	+0.8	12	5,361	sw.	27	nw.	5	12	9	10	5.3	0.0	0.0
Modena	5,473	10	46	24.55	29.83	+.01	54.4	+0.9	82	17	69	29	4	40	43	42	30	47	1.01	+0.2	5	8,242	sw.	47	sw.	21	17	11	3	3.6	2.0	0.0
Salt Lake City	4,360	163	203	25.55	29.87	+.01	59.8	+2.4	84	18	71	36	22	49	34	46	33	40	0.78	−1.1	6	6,445	sw.	33	se.	3	14	9	8	4.4	T.	0.0
Grand Junction	4,602	60	68	25.31	29.84	+.01	63.6	+2.5	90	21	77	38	6	51	34	46	28	32	0.16	−0.6	3	5,982	se.	27	sw.	22	16	12	3	3.9	0.0	0.0
Northern Plateau							**57.0**	**+0.4**										**54**	**1.63**	**+0.2**										**5.7**		
Baker	3,471	48	53	26.43	30.01	+.05	51.2	−0.5	80	17	63	29	27	39	43	43	36	61	1.06	−0.5	12	5,104	se.	24	sw.	29	9	11	11	5.5	T.	0.0
Boise	2,739	79	87	27.11	29.95	+.01	58.4	+1.3	87	17	70	36	15	47	36	48	39	54	1.92	+0.5	8	4,517	nw.	24	nw.	5	8	13	10	5.8	0.0	0.0
Lewiston	757	40	48	29.17	29.98	+.02	59.4	−0.1	86	12	71	39	25	47	39				2.56	+1.0	15	3,321	ne.	24	nw.	13	7	10	14	6.2	0.0	0.0
Pocatello	4,477	60	68	25.43	29.92	+.03	55.4	+1.6	82	18	68	34	27	43	39	45	36	56	0.89	−0.6	11	6,257	se.	47	sw.	21	9	12	10	5.5	0.0	0.0
Spokane	1,929	101	110	27.94	29.98	+.02	55.7	+0.2	79	19	66	35	25	45	34	47	38	57	2.74	+1.3	13	5,237	sw.	25	sw.	19	6	11	14	6.0	0.0	0.0
Walla Walla	991	57	65	28.91	29.98	+.02	59.2	−0.4	83	17	70	40	26	48	33	49	39	53	1.31	−0.3	10	4,136	sw.	24	w.	19	10	12	9	5.1	0.0	0.0
Yakima	1,076	58	67	28.85	30.00		59.4	+0.4	84	12	71	41	24	48	36	47	35	46	0.96	+0.3	4	5,466	nw.	24	nw.	4	9	10	12	5.6	0.0	0.0
North Pacific Coast Region							**54.3**	**+0.6**										**72**	**1.47**	**−0.7**										**6.4**		
North Head	211	11	56	29.87	30.11	+.08	51.7	+0.8	66	28	55	44	11	48	15	48	45	82	1.66	−1.3	11	11,667	n.	49	s.	19	5	14	12	6.6	0.0	0.0
Port Angeles	29	8	53		30.11		51.5		79	28	59	36	11	44	31				0.10	−1.1	3	6,623	sw.	34	w.	9	6	17	8		0.0	0.0
Seattle	125	215	250	29.93	30.06	+.05	54.8	+0.3	76	28	62	43	11	18	27	48	43	68	0.58	−1.3	8	6,143	ne.	26	sw.	9	5	12	14	6.7	0.0	0.0
Tacoma	194	172	201	29.87	30.08	+.06	54.8	+0.7	73	9	63	39	15	46	31				0.62	−1.5	10	6,145	n.	32	sw.	9	6	12	13	6.5	0.0	0.0
Tatoosh Island	86	9	53	29.99	30.09	+.08	50.8	+1.2	65	28	55	43	11	47	16	48	45	82	1.10	−2.9	12	7,003	w.	35	sw.	29	7	7	17	6.8	0.0	0.0
Medford	1,329	29	58	28.60	30.00		57.2		86	11	71	36	15	44	44	49	43	68	3.05	+1.8	12	4,524	nw.	27	nw.	27	9	11	11	5.3	T.	0.0
Portland, Oreg.	153	68	106	29.91	30.07	+.04	57.6	+0.7	81	9	66	41	24	49	32	50	44	66	1.50	−0.7	11	4,740	nw.	24	ne.	27	5	5	21	7.3	0.0	0.0
Roseburg	510	75	99	29.51	30.06	+.03	56.0	0.0	79	16	67	38	24	45	38	49	43	68	3.13	+1.2	14	3,976	n.	18	sw.	2	11	8	12	5.4	0.0	0.0
Middle Pacific Coast Region							**60.8**	**+1.0**										**70**	**0.98**	**0.0**										**4.4**		
Eureka	62	73	89	30.01	30.08	+.03	52.6	+0.6	64	1	57	43	15	48	15	50	47	85	1.41	−0.4	11	6,157	n.	26	n.	25	6	11	14	6.3	0.0	0.0
Red Bluff	330	5	58	29.58	29.93	−.02	67.6	+1.3	94	10	80	44	22	55	34	55	45	53	2.07	+0.9	9	5,461	nw.	24	nw.	25	17	5	9	4.0	0.0	0.0
Sacramento	69	106	117	29.86	29.94	.00	64.2	+0.9	91	26	77	46	22	52	38	55	48	65	.30	−0.5	5	6,735	s.	26	sw	27	19	11	1	2.1	0.0	0.0
San Francisco	155	208	243	29.82	29.99	.00	58.4	+1.6	84	26	65	50	17	52	28	52	48	75	0.65	−0.2	6	5,782	sw.	24	nw.	4	9	12	10	5.4	0.0	0.0
San Jose	141	12	110	29.85	30.00		61.4	+0.7	91	26	73	45	15	50	39				0.48	0.0	5	5,018	nw.	23	nw.	27	18	5	8	4.1	0.0	0.0
South Pacific Coast Region							**64.8**	**+1.4**										**66**	**0.14**	**−0.2**										**4.2**		
Fresno	327	89	98	29.57	29.92	.00	68.9	+1.8	99	12	82	47	22	55	37	55	44	50	0.40	0.0	6	6,273	nw.	26	nw.	27	20	7	4	3.0	0.0	0.0
Los Angeles	338	159	191	29.61	29.97	+.02	63.6	+1.4	92	23	72	51	4	56	29	56	51	71	0.02	−0.4	2	4,488	sw.	15	w.	8	14	9	8	4.7	0.0	0.0
San Diego	87	62	70	29.87	29.96	+.01	61.8	+1.0	82	23	67	47	1	57	26	56	53	77	0.01	−0.3	1	5,196	w.	18	nw.	18	10	11	10	5.0	0.0	0.0
West Indies																																
San Juan, P. R.	82	9	54	29.86	29.95		79.0	+0.4	90	15	84	71	10	74	14				13.82	+8.6	17	7,917	e.	30	e.	1	7	12	12	6.1	0.0	0.0
Panama Canal																																
Balboa Heights	118	6	97		[2]29.82	+.00	80.4	−0.3	92	23	86	72	3	74	18			[1] 86	9.39	+1.4	15	3,733	nw.	22	sw.	6	0	11	20	7.8	0.0	0.0
Cristobal	36	6	97		[2]29.83	−.01	82.0	+1.3	91	19	87	75	28	77	15	76	75	[1] 83	16.55	+4.0	22	4,385	w.	24	nw.	10	2	12	17	7.6	0.0	0.0
Alaska																																
Fairbanks	455	11	44	[1]29.28	[2]29.79		46.3		72	21	58	28	7	35	34	40	31	60	0.22		8	4,139	w.	18	ne.	5	6	11	14	6.4	T.	0.0
Juneau	80	11	50	[1]29.88	[2]29.97		46.4		64	1	52	36	18	41	26	42	38	76	4.91		21	5,508	s.	30	se.	5	4	1	26	8.3	0.0	0.0
Hawaiian Islands																																
Honolulu	38	86	100	[1]30.04	[2]30.08		74.4	−0.4	82	23	78	67	1	70	11	68	65	74	0.68	−1.1	19	8,426	e.	29	ne.	15	5	17	9	6.0	0.0	0.0

[1] Observations taken bihourly.

[2] Pressure not reduced to mean of 24 hours.

TABLE 2.—*Data furnished by the Canadian Meteorological Service, May, 1932*

Stations	Altitude above mean sea level, Jan 1, 1919	Pressure			Temperature of the air						Precipitation		
		Station reduced to mean of 24 hours	Sea level reduced to mean of 24 hours	Departure from normal	Mean max. + mean min. ÷ 2	Departure from normal	Mean maximum	Mean minimum	Highest	Lowest	Total	Departure from normal	Total snowfall
	Feet	*Inches*	*Inches*	*Inches*	*°F.*	*°F.*	*°F.*	*°F.*	*°F.*	*°F.*	*Inches*	*Inches*	*Inches*
Cape Race, N. F	99				38.8		44.7	32.8	59	27	5.06		0.0
Sydney, C. B. I	48	29.89	29.94	−0.03	48.0	+2.8	58.3	37.7	87	30	1.04	−2.73	0.0
Halifax, N. S	88	29.86	29.97	−.01	49.6	+1.2	60.2	39.0	80	30	1.67	−2.59	0.0
Yarmouth, N. S	65	29.88	29.95	−.03	48.5	+0.9	56.7	40.3	63	31	2.40	−1.17	0.0
Charlottetown, P. E. I	38	29.87	29.91	−.05	48.5	+1.6	56.8	40.2	83	32	1.16	−1.75	T.
Chatham, N. B	28	29.82	29.85	−.10	51.3	+2.8	64.1	38.5	91	29	2.52	−0.69	0.0
Father Point, Que	20	29.90	29.92	−.01	46.6	+2.6	54.9	38.3	74	29	0.69	−1.89	0.0
Quebec, Que	296	29.65	29.97	+.03	52.9	+3.0	63.9	41.9	89	29	2.16	−0.92	0.0
Doucet, Que	1,236				46.4		61.7	31.1	86	13	1.22		3.6
Montreal, Que	187	29.76	29.96	+.02	57.0	+2.3	66.8	47.2	90	21	2.11	−0.84	0.0
Ottawa, Ont	236	29.73	29.99	+.05	56.7	+1.8	68.2	45.2	88	31	0.86	−1.73	0.0
Kingston, Ont	285	29.71	30.02	+.06	53.4	+0.5	61.3	45.5	76	34	1.60	−1.08	0.0
Toronto, Ont	379	29.63	30.03	+.05	55.3	+2.1	64.3	46.3	83	32	3.19	+0.15	0.0
Cochrane, Ont	930				49.8		63.7	35.9	88	22	1.21		T.
White River, Ont	1,244	28.67	29.99	+.04	48.5	+2.8	63.6	33.3	85	16	1.21	−0.74	1.0
London, Ont	808				53.6		63.8	43.4	82	24	5.02		0.0
Southampton, Ont	656	29.33	30.05	+.09	51.8	+1.1	60.7	42.9	84	25	3.04	+0.60	0.0
Parry Sound, Ont	688	29.33	30.03	+.08	52.6	+1.5	62.1	43.0	82	27	2.98	+0.05	0.0
Port Arthur, Ont	644	29.28	29.99	+.03	50.2	+4.3	59.6	40.9	81	30	2.11	−0.04	T.
Winnipeg, Man	760	29.20	30.04	+.08	54.9	+3.3	67.5	42.3	92	25	0.73	−1.55	0.0
Minnedosa, Man	1,690	28.19	30.00	+.04	53.7	+5.3	67.6	39.8	90	24	0.67	−0.78	0.0
Le Pas, Man	860				53.1		66.9	39.3	87	28	1.58		0.0
Qu'Appelle, Sask	2,115	27.69	29.92	−.02	53.7	+3.9	67.5	39.9	87	24	1.97	+0.32	0.0
Moose Jaw, Sask	1,759				56.8		72.0	41.5	89	24	0.28		0.0
Swift Current, Sask	2,392	27.38	29.88	−.04	55.0	+4.3	69.2	40.8	86	26	0.83	−0.93	0.0
Medicine Hat, Alb	2,365	27.40	29.87	−.02	55.5	+1.4	67.4	43.7	85	32	1.76	+0.45	0.0
Calgary, Alb	3,540	26.23	29.90	+.02	49.4	+0.4	60.4	38.5	76	31	3.40	+1.63	0.0
Banff, Alb	4,521	25.34	29.89	+.01	46.0	−1.0	58.3	33.8	72	25	1.41	−0.63	1.6
Prince Albert, Sask	1,450	28.39	29.96	+.01	54.9	+7.3	69.3	40.6	85	27	1.37	+0.11	0.0
Battleford, Sask	1,592	28.19	29.92	.00	54.2	+3.2	68.4	39.9	84	29	2.27	+0.65	0.0
Edmonton, Alb	2,150	27.57	29.83	−.05	54.1	+3.3	66.4	41.9	81	30	1.63	+0.08	0.0
Kamloops, B. C	1,262												
Victoria, B. C	230	29.82	30.08	+.08	52.7	+0.2	59.4	46.1	76	41	0.29	−1.19	0.0
Barkerville, B. C	4,180												
Estevan Point, B. C	20												
Prince Rupert, B. C	170												
Hamilton, Ber	151				70.0	+0.6	75.0	65.0	81	61	2.24	−2.42	0.0

LATE REPORTS FOR APRIL, 1932

Winnipeg, Man	760	29.29	30.14	+.12	38.3	+2.4	47.2	29.4	72	−18	1.07	+0.02	1.5
Medicine Hat, Alb	2,365	27.37	29.86	−.06	46.7	+2.2	57.8	35.6	76	27	1.87	+1.13	1.2
Calgary, Alb	3,540	26.18	29.87	−.03	40.9	−1.3	49.5	32.3	67	24	3.87	+3.23	22.6
Banff, Alb	4,521	25.28	29.87	−.03	38.5	+3.2	48.0	29.0	65	18	1.89	+0.81	7.8
Edmonton, Alb	2,150	27.58	29.87	−.02	42.2	+2.3	51.9	32.6	67	23	2.03	+1.15	0.5
Kamloops, B. C	1,262	28.60	29.90	−.03	50.3	+1.4	59.6	41.0	74	31	0.61	+0.22	0.0
Estevan Point, B. C	20				44.5		49.7	39.4	61	30	8.83		0.0
Prince Rupert, B. C	170				45.9		53.2	38.6	70	32	3.26		0.0

SEVERE LOCAL STORMS, MAY, 1932

[The table herewith contains such data as have been received concerning severe local storms that occurred during the month. A revised list of tornadoes will appear in the Annual Report of the Chief of Bureau]

Place	Date	Time	Width of path (yards)[1]	Loss of life	Value of property destroyed	Character of storm	Remarks	Authority
Manor, Wash	1	2 p. m.				Hail	Tulip blossoms destroyed; strawberry plants damaged.	Official, U. S. Weather Bureau.
Rice County, Kans	2	7 a. m.	6 mi.			do	Poultry killed; fruit injured; path 15 miles long	Do.
Page County, Iowa	4	4:30–5 p. m.			$6,000	do	Damage chiefly to auto tops, greenhouses, and windows.	Do.
Clayton County, Iowa	4	5:30–10 p. m.			200,000	Rain and flood	Many bridges and some track washed out; business houses flooded; streets covered with mud; sewers damaged; telephone communication disrupted.	Do.
Marshall County, Iowa	4	7–8:30 p. m.			10,500	Wind, rain, and flood.	Chief damage to crops by floods	Do.
Story County, Iowa	4					do	Considerable farm property damaged; poultry and pigs drowned.	Do.
Plymouth County, Iowa	4–5				20,000	Rain and flood	Heavy damage to merchandise, railway tracks and roads by water; quantity of lumber floated away.	Do.
Mason City, Nebr	5	6–7 p. m.	5 mi.			Hail	Roofs, windows, and auto tops damaged; path 11 miles long.	Do.
Walthill, Nebr	5	10–11:15 p. m.				Hail and rain	Gardens considerably damaged	Do.
Lyons, Nebr	5	11 p. m.			1,500	Wind	Buildings damaged; trees uprooted	Do.
Winneshiek County, Iowa	5				50,000	Rain and flood	Much farm land inundated; bridge approaches washed out.	Do.

[1] "Mi." signifies miles instead of yards.

Severe Local Storms, May, 1932—Continued

Place	Date	Time	Width of path (yards)[1]	Loss of life	Value of property destroyed	Character of storm	Remarks	Authority
Rappahannock and Warren Counties, Va.	6	4–5:30 p. m.	1.5 mi.		2,000	Hail	Fruit trees, gardens, autos, and roofs damaged	Official, U. S. Weather Bureau.
Abilene, Tex	6	4:45 p. m.				do	Small orchards and gardens hurt; auto tops and roofs pierced.	Do.
Renfrow, Okla., to Sumner County, Kans.	6	5:30 p. m.	2 mi.		70,000	Heavy hail	Heavy property damage	Do.
Mount Horeb (near), Wis.	6	6 p. m.			5,000	Possibly tornado	Several farm buildings damaged	Do.
Mills County, Iowa	6	6–7 p. m.			14,000	Rain, hail, and flood.	Cellars and roadbeds damaged by floods; roofs pierced; gardens and crops injured.	Do.
Del Rio, Tex	6	P. m.				Hail and rain	Trees, gardens, cars, and roofs damaged	Do.
Jal, N. Mex	6	do				Heavy hail	No details	Do.
Paw Paw, Toluca, Arlington (near), Spring Valley, Ottawa, Sterling and Moline, Ill.	6			2		Electrical, wind and hail.	Buildings damaged, several burned; telephone and electric service impaired, stock killed, machinery and grain ruined.	Do.
Kaufman (near), Tex	7	10 a. m.	880		8,000	Tornado	Roofs damaged: telephone poles blown down	Do.
Tehachapi, Calif	7	1.15 p. m.				Hail	Pears damaged 25 per cent	Do.
Republic County, Kans.	8	4 p. m.	2 mi.			Heavy hail	Heavy damage in Union, Rydal, Bellville and Cuba communities chiefly to trees, roofs, alfalfa, and gardens; path 24 miles long.	Do.
Montgomery County, Iowa.	8	4.30–5 p. m.			2,500	Wind, rain, and flood.	Crops, gardens, and small buildings damaged	Do.
Adams County, Iowa	8	5 p. m.			4,000	Heavy hail	Fruit trees and gardens badly injured	Do.
Riley County, Kans	8	6.30 p. m.	3 mi.			do	Wheat and oats considerably damaged	Do.
Cedar Rapids, Iowa	8	7 p. m.			2,500	Wind	Building damaged; car wrecked	Do.
Wabaunsee County, Kans.	8	7.30 p. m.	50		2,500	Tornado	Chief damage to small farm buildings, fences, and telephone lines; path 10 miles long.	Do.
Osage County, Kans	8	9–9.30 p. m.	1–3 mi.			Heavy hail	Damage comparatively light, due to time of year; path 10 miles long.	Do.
Chula, Mo	8	P. m.	2 mi.		10,000	Hail	Fruit and shade trees stripped; crops and gardens considerably damaged; path 20 miles long.	Do.
Ballinger, Tex., and vicinity.	8					Hail and wind	Extensive damage to crops and buildings	Do.
Bellbuckle and Nashville, Tenn.	8			3	3,000	Electrical and wind.	Residences and barns damaged; crops injured; 2 persons hurt.	Do.
Crawford, Knox, Holmes, and Tuscarawas Counties, Ohio.	8					Severe hail and rain.	No details	Do.
Marianna, Ark	8				1,000	Wind	Damage at lumber mill to smokestack and machinery.	Do.
Faulkner, White, and Prairie Counties, Ark.	8–9				35,000	Hail	Buildings and crops damaged; some livestock killed.	Do.
San Angelo (near), Tex	9	10 p. m.	1,760		95,000	Heavy hail	Chief damage to roofs, windows, and auto tops; path 10 miles long.	Do.
Spartanburg, Marion, and Clarendon Counties, S. C.	9	P. m.			101,500	Hail and wind squalls.	Severe crop loss	Do.
Atwood and Kenton, Tenn.	9				40,000	Hail	Crops, roofs, and glass damaged or broken	Do.
Gaffney, S. C.	10	3 a. m.			15,000	Wind and hail	No details	Do.
Crosby, Tex	10	11.15 a. m.	4.5 mi.		10,000	Hail	Heavy crop damage	Do.
Columbia, S. C. (8 miles north).	10	3 p. m.	1,760		100,000	Hail and wind squalls.	175 plantations affected; 60 per cent of wheat and 80 per cent of oats practically destroyed; other crops damaged; path 40 miles long.	Do.
Spartanburg County, S. C.	10	6.30 p. m.			10,000	Wind and hail	Much crop injury	Do.
Mecklenburg and Cabarrus Counties, N. C.	10	P. m.	3 mi.			Hail	Heavy damage to roofs, fruit, gardens, and crops; path 5 miles long.	Do.
Robeson, Bladen, and Columbus Counties, N. C.	10	P. m.	1–3 mi.			Heavy hail	About two-thirds tobacco, corn, and cotton injured; windows broken; fruit hurt; some loss of pigs and poultry; path 20 miles long.	Do.
Eagle Pass (near), Tex	11	12.30 a. m.	3 mi.		5,000	Hail	Goats killed; corn, vegetables and pecan crops injured.	Do.
Spartanburg County, S. C. (central).	11	3 p. m.			4,000	Hail and wind	Crops hurt	Do.
Gage and Las Cruces, N. Mex.	11	3–4 p. m.	1,760			Hail	Gardens, roofs, and auto tops considerably damaged.	Do.
El Paso, Tex	11					Rain	Streets and roads flooded; pavements washed out places; street-car traffic interrupted.	Do.
Victorville, Calif	13	11.20 a. m.	10 mi.			Hail	Fruit knocked off; roofs pierced; auto tops riddled.	Do.
Georgetown to Wier and Jonah, Tex.	15	1.30 p. m.	3 mi.			do	Corn and cotton damaged	Do.
Southbridge (near), Mass.	15	3 p. m.	33		500	Possibly tornado	Lumber shed unroofed; cars damaged; path one-half mile long.	Do.
Flatonia, Tex	15	4 p. m.	6 mi.			Wind	Skylights, auto tops, and roofs damaged	Do.
Maple Hill, Kans. (1 mile southeast).	15	4.30 p. m.	440		3,000	Tornado	Farm buildings and implements damaged; path one-half mile.	Do.
Omega, Okla. (5 miles southeast).	15	5 p. m.	3 mi.			Hail	Crops damaged; path 4 miles	Do.
Dublin (near), Okla	15	8.20 p. m.	1.5 mi.			Hail	Crops damaged	Do.
Linn and Mills Counties, Iowa.	15				7,225	Wind	Chief damage to farm property	Do.
Brownsville, Tex., and vicinity.	16	7:20–8 a. m.		1		Thundersquall	Boat upset; buildings damaged; crops hurt	Do.
Otto, Tex., and vicinity	16					Heavy hail	Crops and outbuildings damaged	Do.
Galen, Mont	18				1,000	Wind	Buildings damaged	Do.
Louisiana (southeastern)	18				3,000	do	Some land lake river-front property damaged	Do.
Pensacola (near), Fla	19	10.48–10.53 a. m.		1		Waterspout—tornado.	Home and barn wrecked; 2 persons injured	Do.
Long Island, N. Y. (western).	21					Electrical and rain	Streets and cellars flooded; roads impassable in places; buildings damaged by lightning.	Long Island Sunday Press (Jamaica, L. I.).
Pocatello, Idaho, and vicinity.	21			1		Wind	Light buildings overturned; signs, fences blown down; trees broken; grand stand wrecked.	Official, U. S. Weather Bureau.
Sioux County, Iowa	23	4 p. m.			25,800	Hail and wind	Oat fields damaged; gardens and fruit trees stripped; windmill and several sheds wrecked.	Do.
Le Mars and Kingsley, Iowa (vicinity of).	23	P. m.			2,100	Wind, hail, and flood.	Barn blown over; pigs and chickens drowned; fences washed out.	Do.
Abilene, Tex	24	1 p. m.			600	Wind	Plate-glass windows, signs, and awnings damaged.	Do.
Keya Paha County, Nebr.	25	2.30 p. m.	6 mi.			Hail	Considerable crop loss in places	Do.
Kansas-Nebraska line 14 miles northeast of Atwood, Kans.	25	3–3.30 p. m.	110	2	10,000	Tornado	Character of damage not reported; path 10 miles long.	Do.
Shenandoah (near), Iowa	25	5 p. m.	100		1,000	do	Damage to buildings; path 4 miles long	Do.

Severe Local Storms, May, 1932—Continued

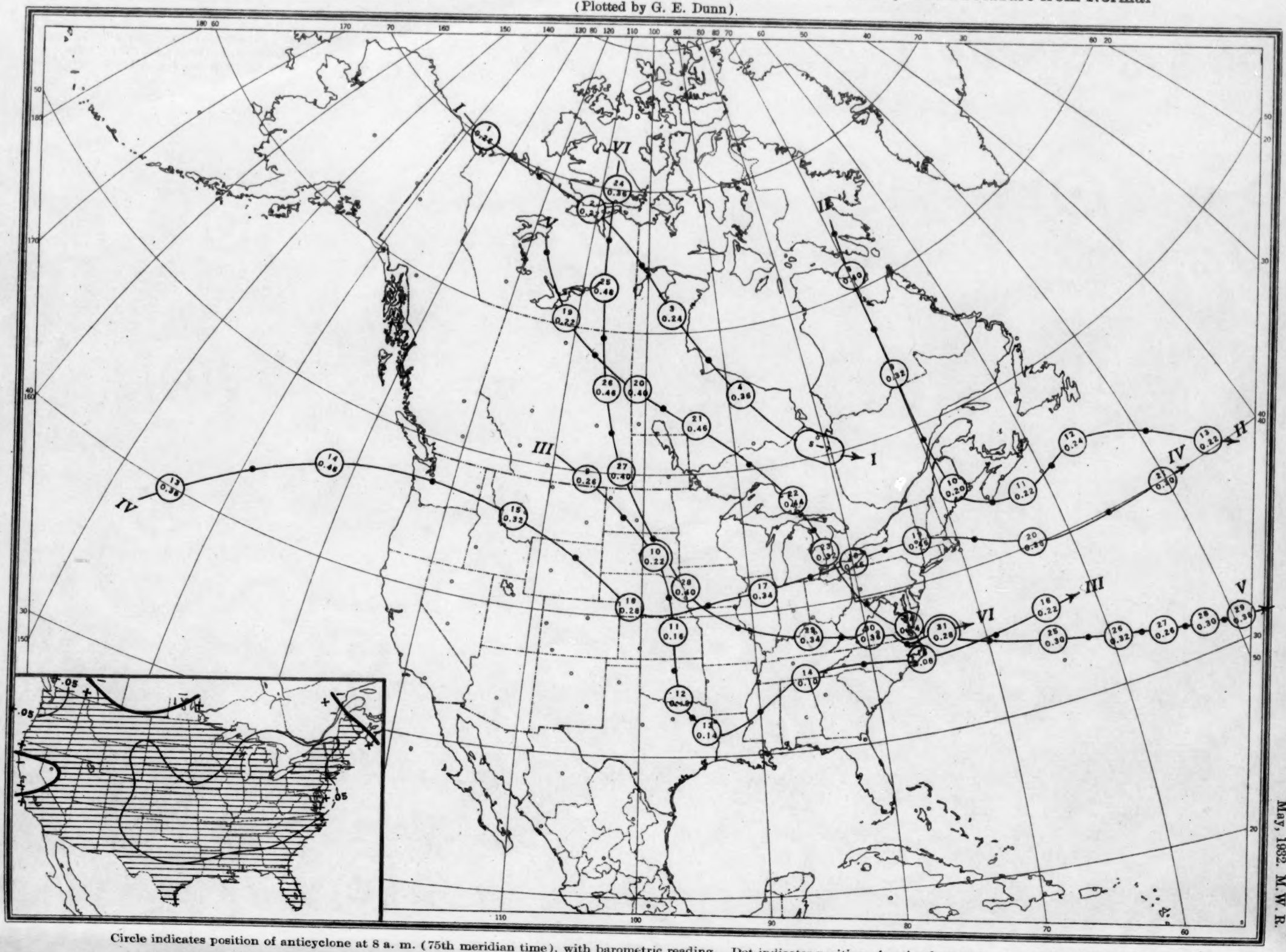
Place	Date	Time	Width of path (yards)[1]	Loss of life	Value of property destroyed	Character of storm	Remarks	Authority
Furnas County, Nebr.	25	7 p. m.	5-15 mi.			Hail and rain	Crops damaged chiefly by rain; path 20 miles long.	Official, U. S. Weather Bureau.
Madison, Nebr. (6 miles northwest).	25	8 p. m.	33		1,500	Tornado	Buildings damaged; trees uprooted; overhead wires blown down; path 2 miles long.	Do.
Plymouth County, Iowa	25	9-9.30 p. m.			20,000	Wind, rain, and flood.	Crops, buildings, and trees damaged; livestock drowned.	Do.
Schleswig to Arthur, Iowa	25	10 p. m.	66		15,000	Tornado	Farm buildings damaged; path 9 miles long	Do.
Schleswig (near) to Wall Lake (near), Iowa.	25	10-10.30 p. m.	50		25,000	do	Chief damage to buildings; path 15 miles long	Do.
Galva, Ill.	25					Wind	Small buildings and trees damaged	Do.
Sterling, Colo. (southeast of).	25					Tornado	Small buildings demolished; houses unroofed; livestock killed; farm equipment damaged.	Do.
Story County, Iowa	25-26				9,000	Windsqualls	Damage chiefly to farm property	Do.
Rochelle (near), Tex.	26	4 p. m.	100		300	Tornado	Sheep shed and barn damaged	Do.
Boston, Mass., and vicinity.	26	do		2		Electrical, wind, and rain.	Much shore property damaged or wrecked; streets flooded; autos stalled; 2 persons injured.	Boston Post (Mass.).
Fayetteville, Ark.	26					Electrical	2 large barns destroyed	Official, U. S. Weather Bureau.
Ozark, Ark.	26				5,000	Wind	Buildings and crops damaged	Do.
Baltimore and Charles Counties, Md.	27					Thundergusts	Trees blown down; overhead wires broken; 3 barns demolished.	Do.
Otsego County, N. Y. (southern).	27					Thunderstorm and wind.	Many trees blown down, damaging wires and houses and blocking highways.	Do.
Hope, N. Mex.	28	2.15 p. m.	5 mi.		6,000	Hail	Lambs and poultry killed; gardens and orchards injured; roofs damaged.	Do.
Hassel, N. Mex.	28	4 p. m.	2 mi.			do	640 acres of wheat destroyed	Do.
Estancia, N. Mex., and vicinity.	28	4-4.45 p. m.	8 mi.		50,000	do	100 square miles of crops totally destroyed; roofs, windows, and trees damaged.	Do.
St. Joseph, Mo., and vicinity.	30	2.30-3 p. m.	4 mi.		18,000	Hail and rain	Much damage to greenhouses and growing truck crops; fruit knocked off; soil washed; path 6 miles long.;	Do.
Alliance, Nebr.	30	5.45-7 p. m.			5,000	Wind	Number of buildings damaged; crop loss about 30 per cent in small area.	Do.
Weatherford, Okla. (north of).	31	7 p. m.	4 mi.		30,000	Hail	Crops and other property damaged; path 5 miles long.	Do.
Clinton, Okla. (north of)	31	8.30-9.30 p. m.	5 mi.		100,000	do	Heavy crop loss; path 15 miles long	Do.
Grady County, Okla.	31	9-10 p. m.	1.5 mi.		75,000	do	Heavy crop loss; path 6 miles long	Do.
Emmett, Idaho	31				15,000	do	Fruit ruined	Do.

Chart I. Departure (°F.) of the Mean Temperature from the Normal, May, 1932

Chart I. Departure (°F.) of the Mean Temperature from the Normal, May, 1932

Chart II. Tracks of Centers of Anticyclones, May, 1932. (Inset) **Departure of Monthly Mean Pressure from Normal**

(Plotted by G. E. Dunn).



Circle indicates position of anticyclone at 8 a. m. (75th meridian time), with barometric reading. Dot indicates position of anticyclone at 8 p. m. (75th meridian time).

Chart III. Tracks of Centers of Cyclones, May, 1932. (Inset) **Change in Mean Pressure from Preceding Month**

(Plotted by G. E. Dunn)

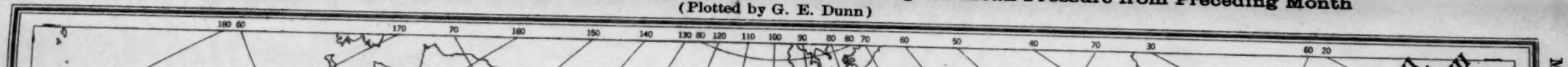
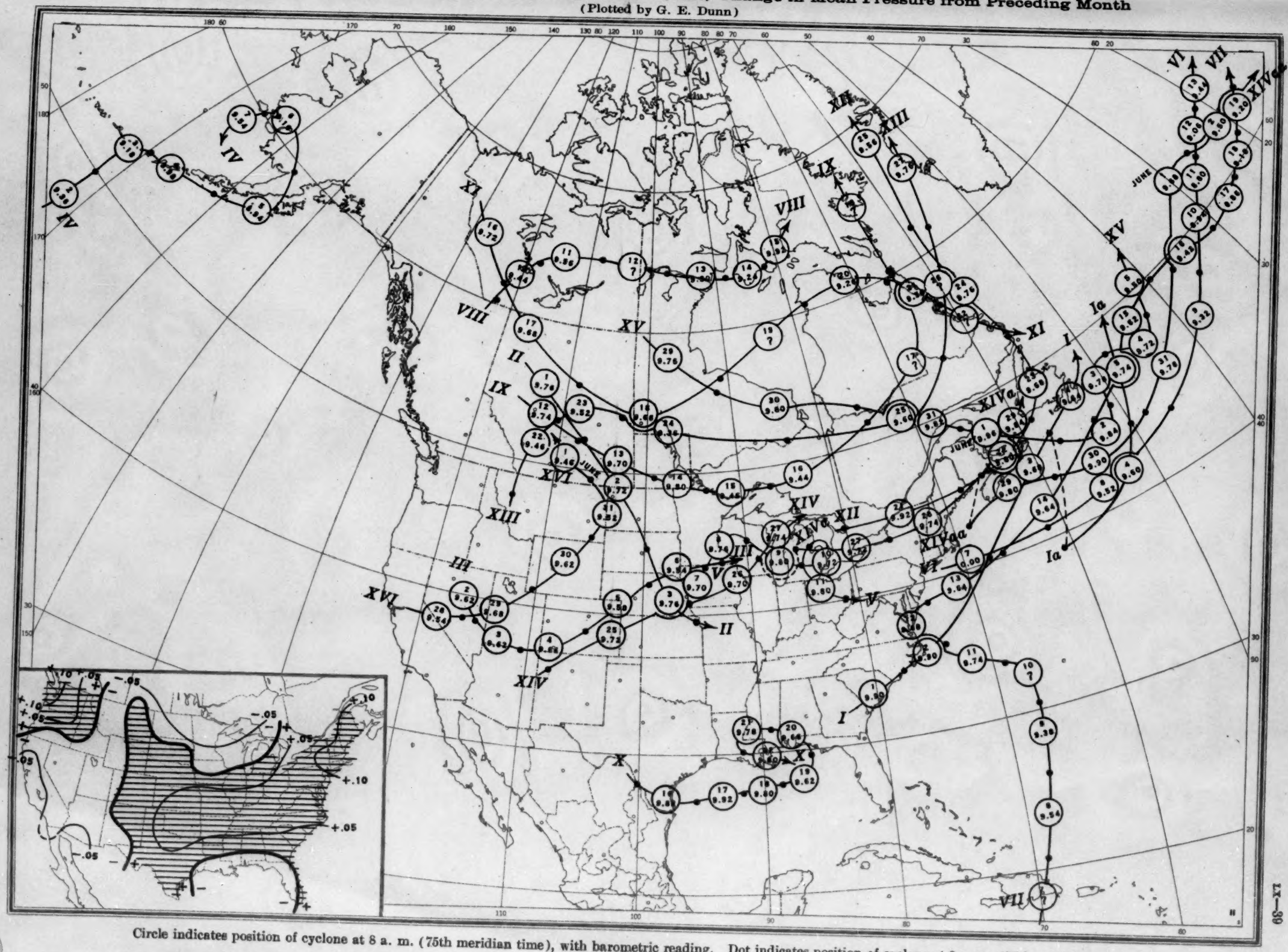


Chart III. Tracks of Centers of Cyclones, May, 1932. (Inset) Change in Mean Pressure from Preceding Month

(Plotted by G. E. Dunn)



Circle indicates position of cyclone at 8 a. m. (75th meridian time), with barometric reading. Dot indicates position of cyclone at 8 p. m. (75th meridian time).

Chart IV. Percentage of Clear Sky between Sunrise and Sunset, May, 1932

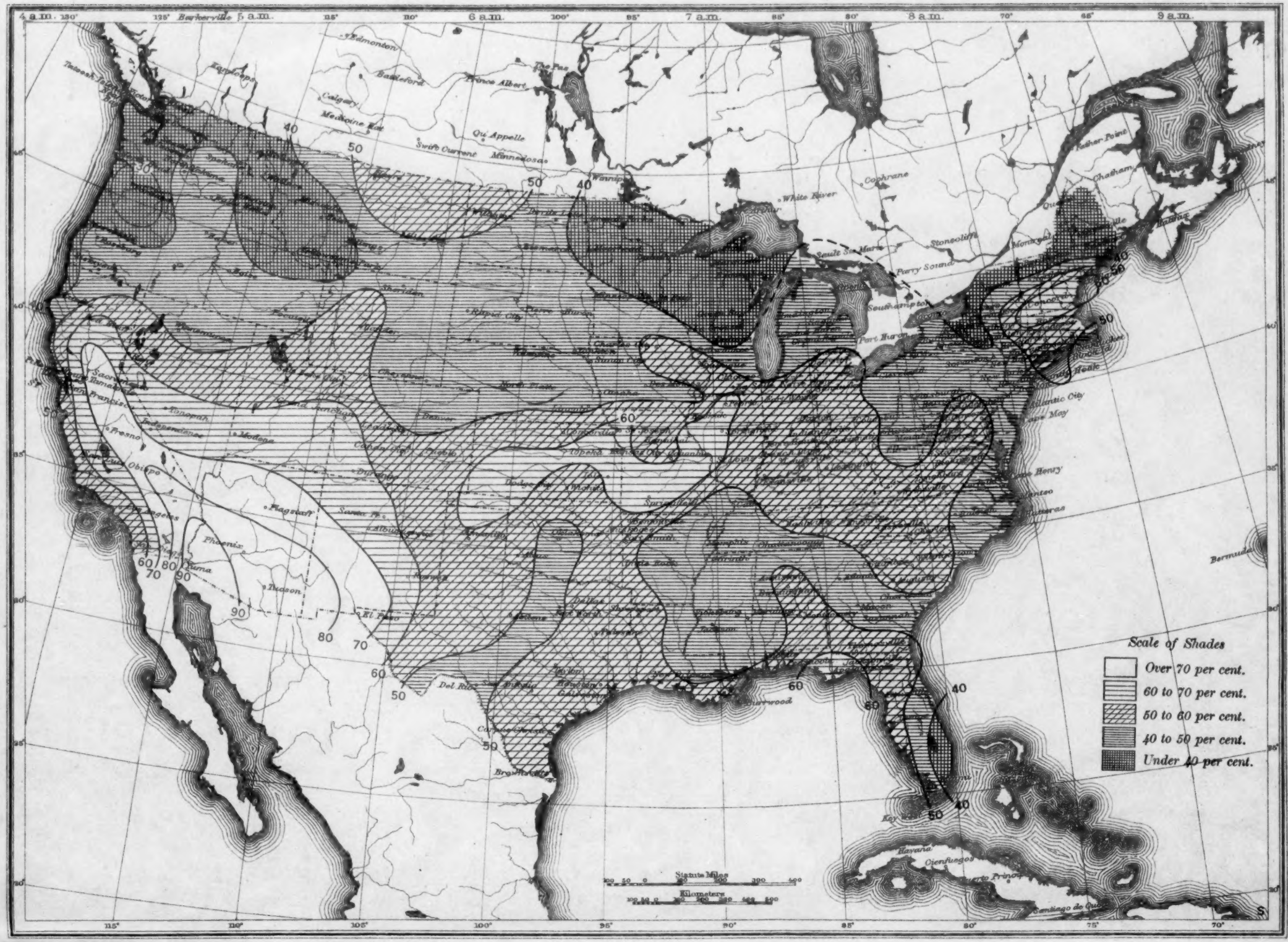


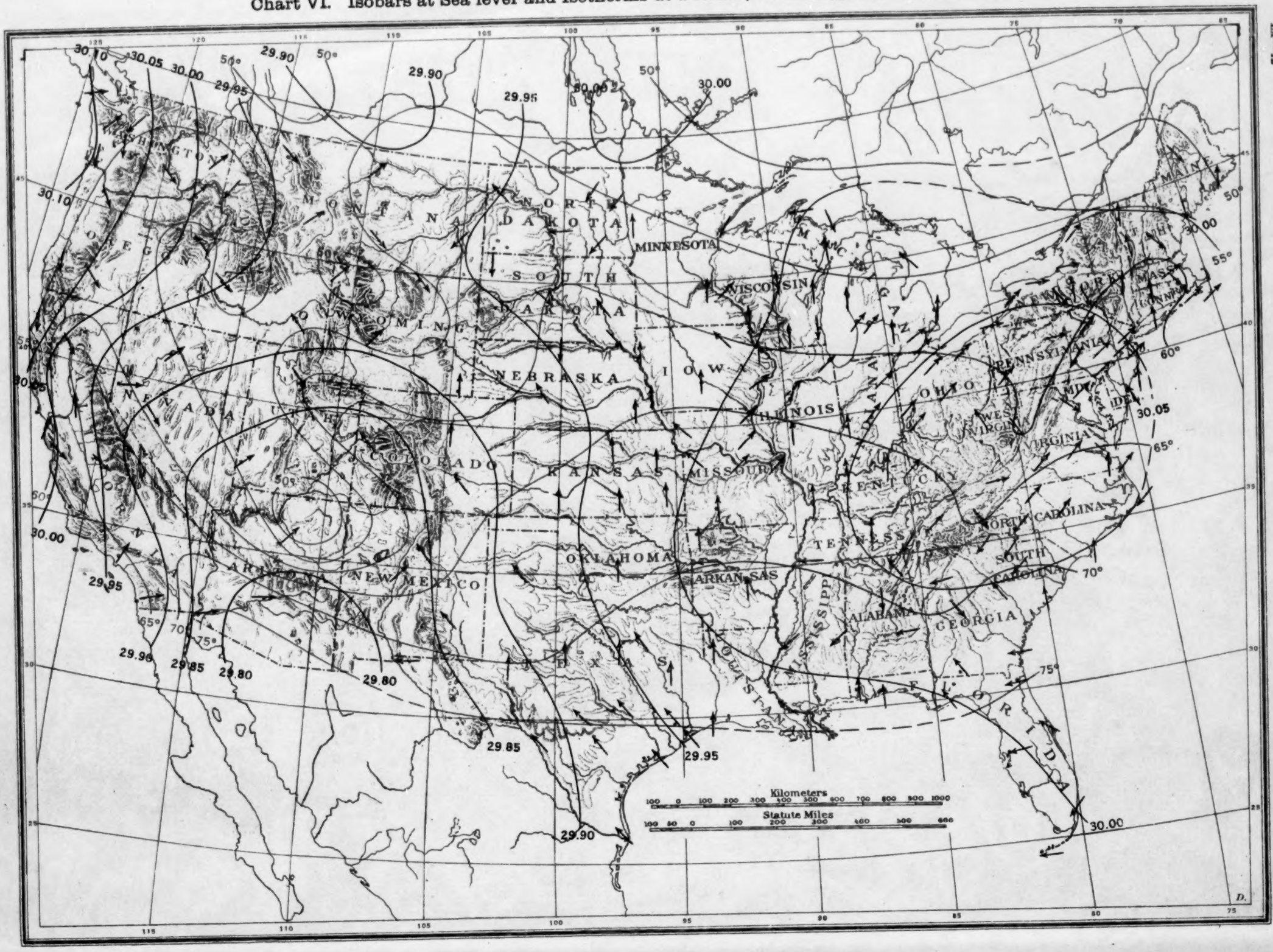
Chart V. Total Precipitation, Inches, May, 1932. (Inset) Departure of Precipitation from Normal

Chart V. Total Precipitation, Inches, May, 1932. (Inset) Departure of Precipitation from Normal

May, 1932. M. W. R.

IX—41

Chart VI. Isobars at Sea level and Isotherms at Surface; Prevailing Winds, May, 1932



May, 1932. M. W. R.

Chart VIII. Weather Map of North Atlantic Ocean, May 13, 1932

(Plotted from the Weather Bureau Northern Hemisphere Chart)

Chart VIII. Weather Map of North Atlantic Ocean, May 13, 1932

(Plotted from the Weather Bureau Northern Hemisphere Chart)

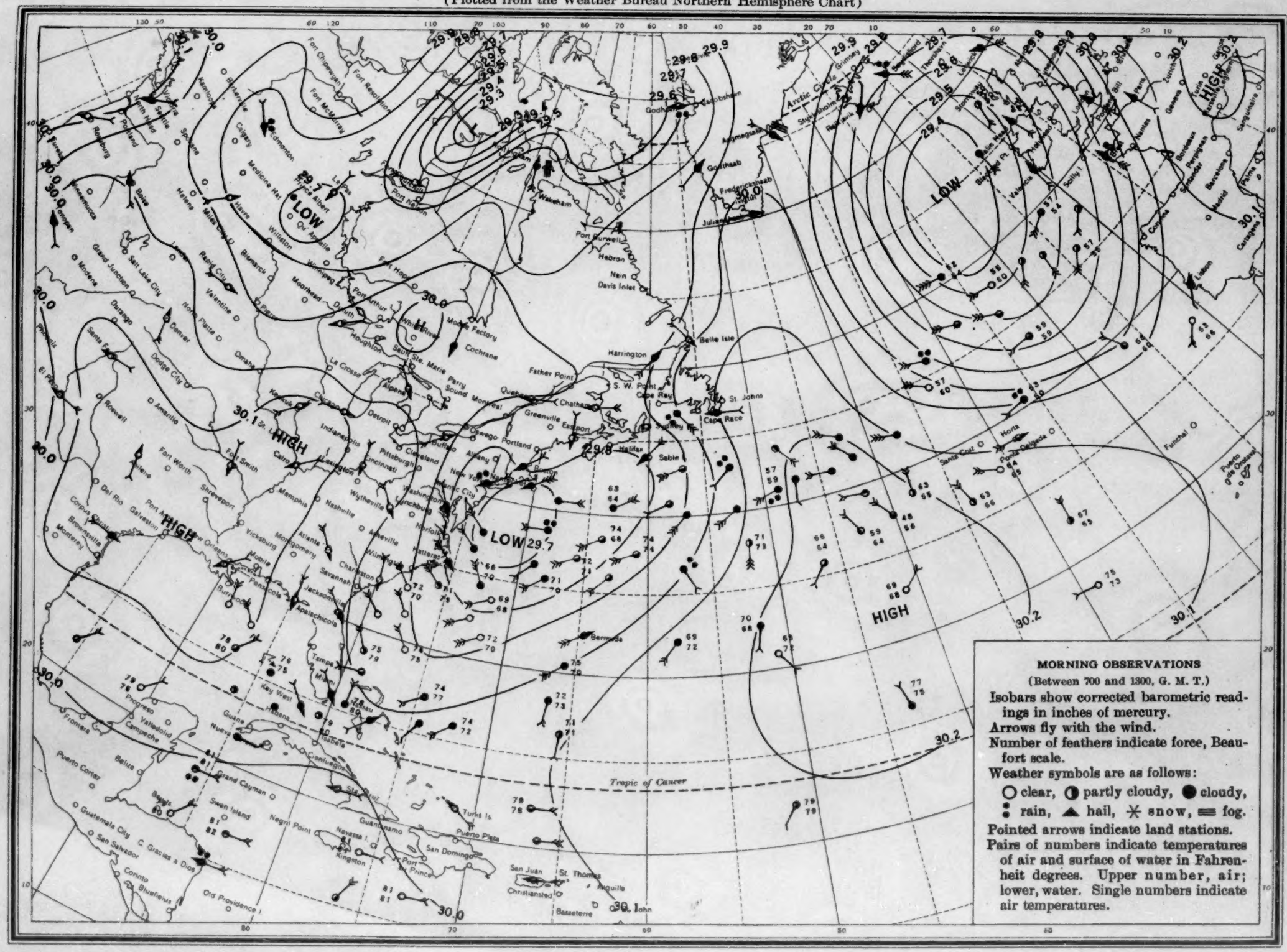


Chart IX. Weather Map of North Atlantic Ocean, May 21, 1932

(Plotted from the Weather Bureau Northern Hemisphere Chart)

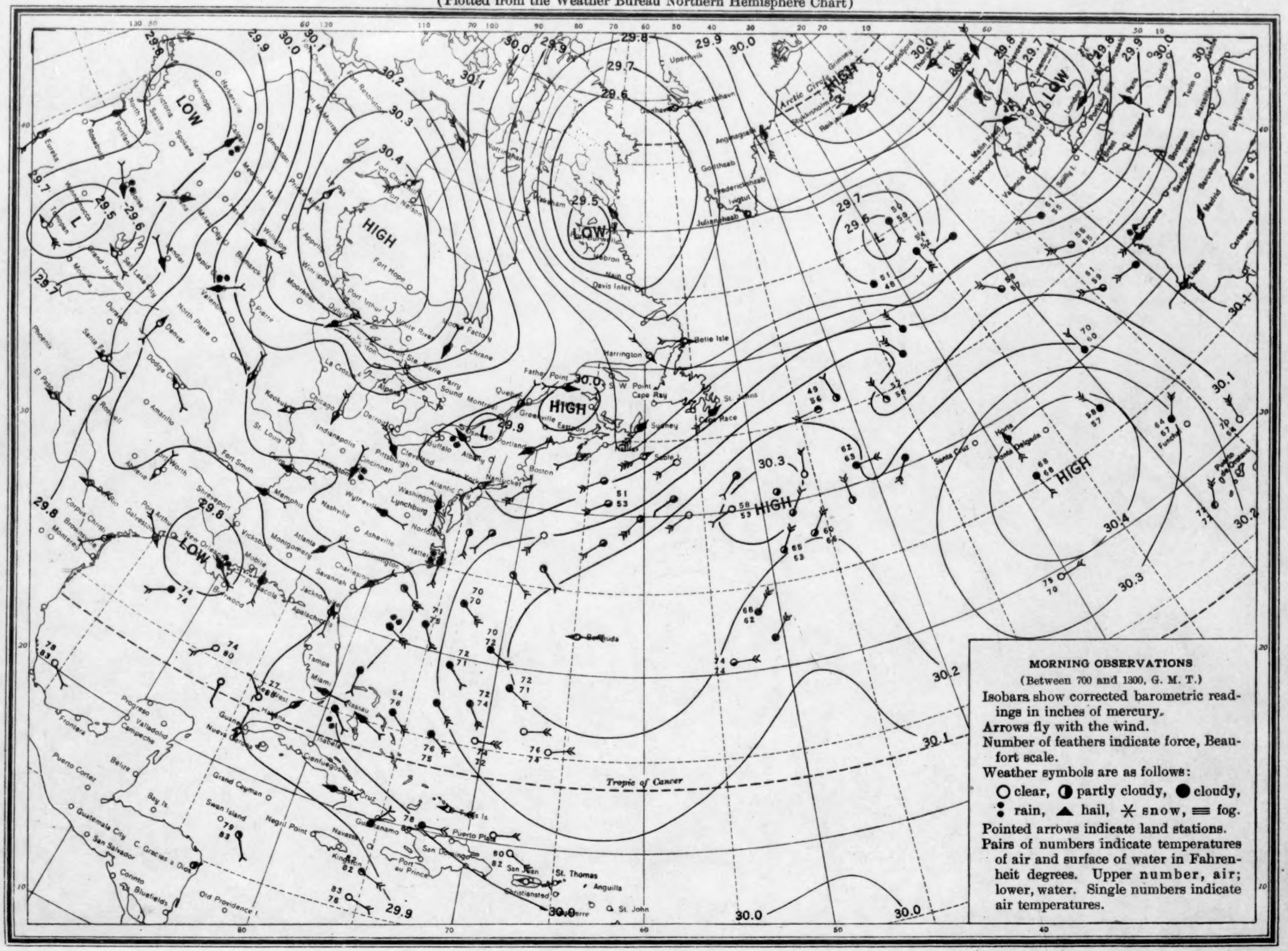


Chart X. Weather Map of North Atlantic Ocean, May 22, 1932

(Plotted from the Weather Bureau Northern Hemisphere Chart)

Chart X. Weather Map of North Atlantic Ocean, May 22, 1932

(Plotted from the Weather Bureau Northern Hemisphere Chart)

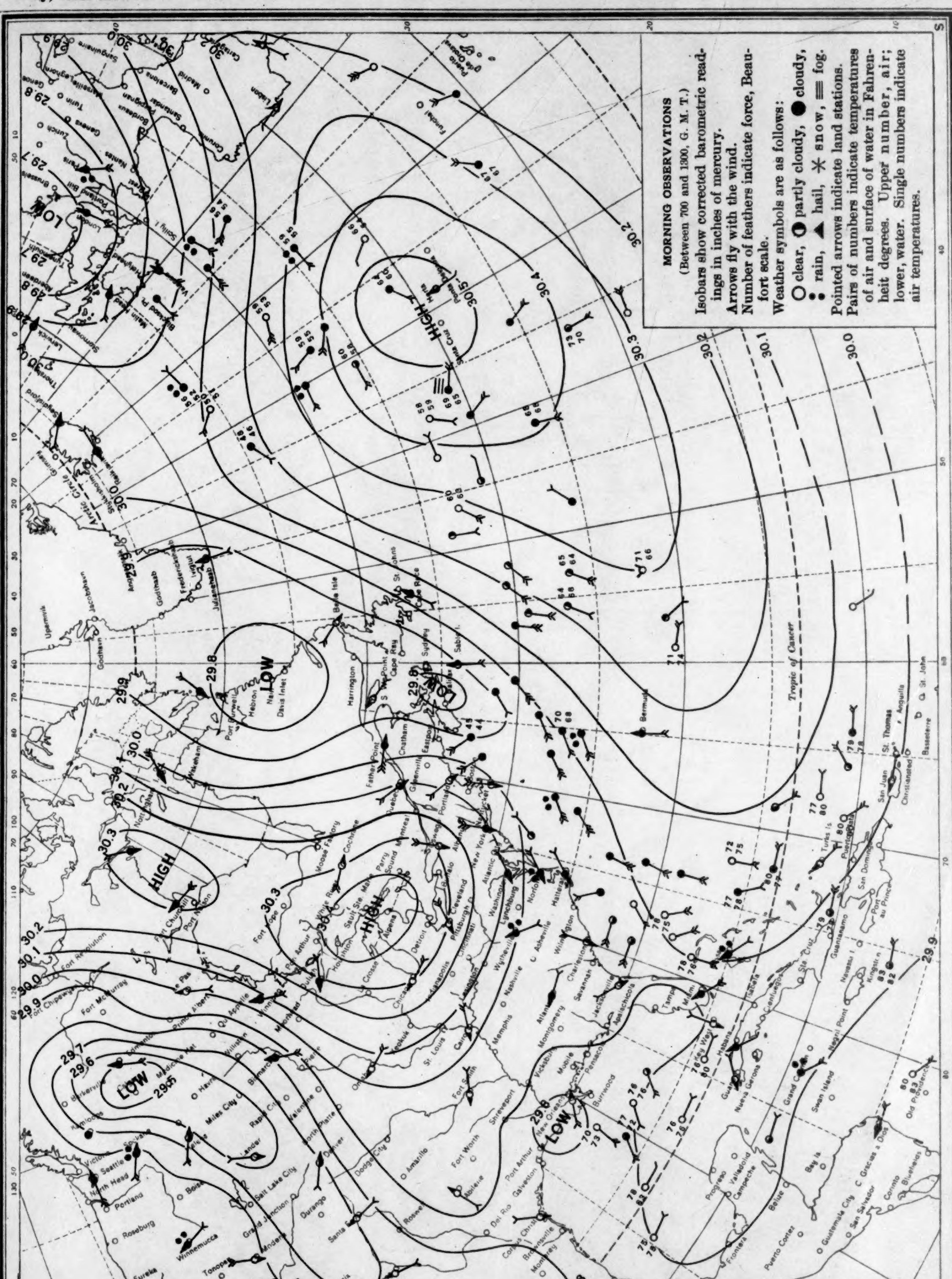


Chart XI. Weather Map of North Atlantic Ocean, May 23, 1932

(Plotted from the Weather Bureau Northern Hemisphere Chart)